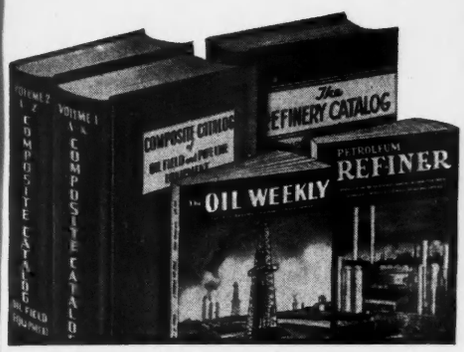

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The **OIL WEEKLY**

ENGINEERING NEWS STATISTICS

R. L. DUDLEY, President, Publisher A. L. BURNS, General Manager

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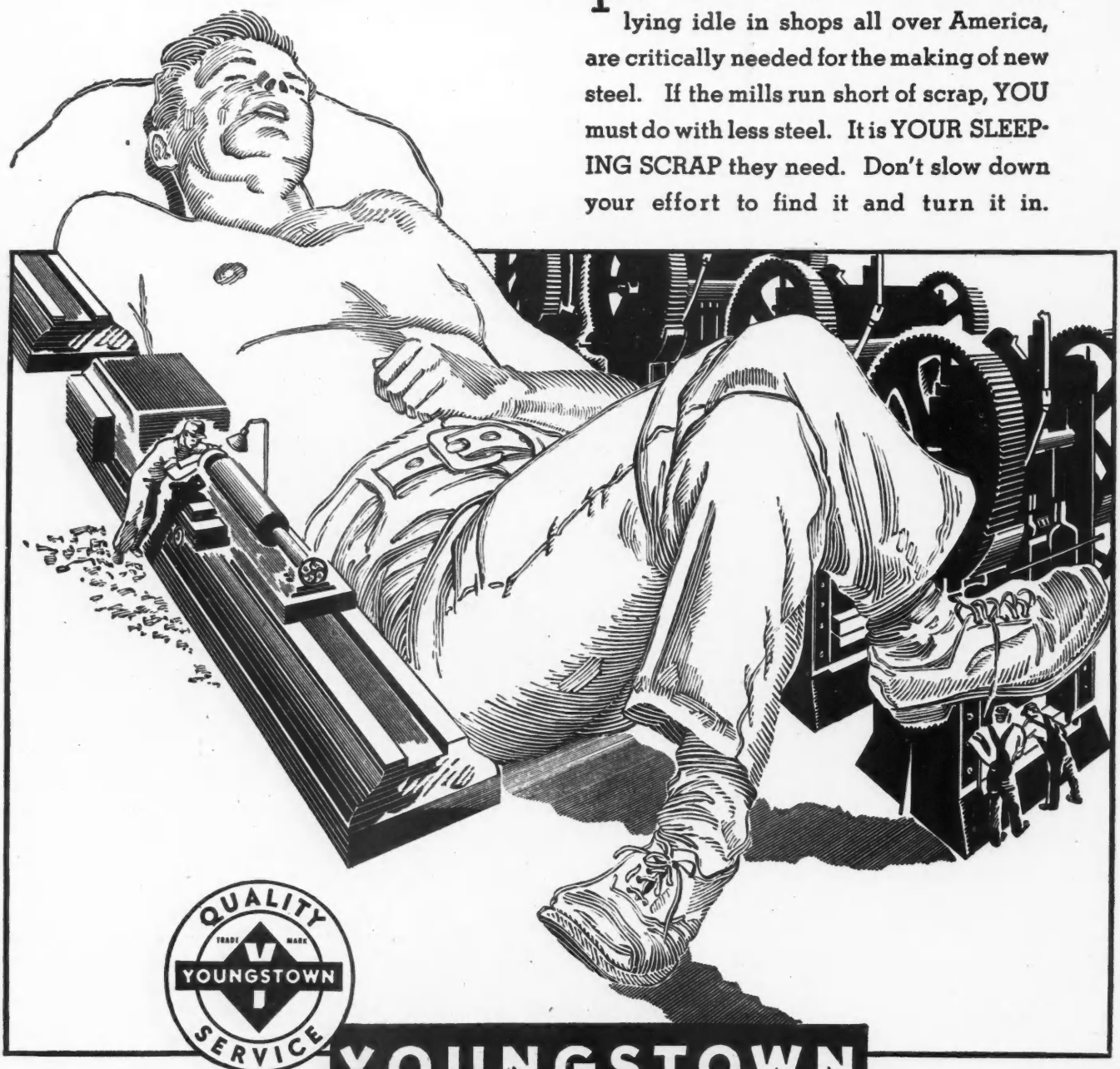
THE millions of tons of dormant scrap, lying idle in shops all over America, are critically needed for the making of new steel. If the mills run short of scrap, YOU must do with less steel. It is YOUR SLEEPING SCRAP they need. Don't slow down your effort to find it and turn it in.



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THE OUTLOOK

THE DEPARTMENT of Justice may spring a minor surprise when it comes time to go into court again this month on the "Mother Hubbard" suit, but officials are keeping dead secret their decision, already reached, on the next step in the long-dragging case.

OGD HAS DROPPED all planning for activities beyond June 30 until Senate sentiment regarding continuation of the division is disclosed. Should the Senate go along with the House in wiping out all functions except Connally Hot Oil Act enforcement, a special session of NPC may be called to act on reports of committees set up last month, before the deadline.

DEVELOPMENT of a glass which has sufficient conductivity to permit an electrical current to be passed through it offers a readily defrosted enclosure for the driller, switcher or others who must maintain clear visibility for safe operation of his equipment. Heat from the current will melt sleet, snow or ice and prevent fogging.

BUREAU OF MINES scientists believe that the wartime development of synthetic products from natural gas will pave the way in the next few years for a whole industry, producing hundreds of products.

ANTI-POLLUTION legislation, pressed over a number of years, is expected to pass the Senate this session and may also get through the House, although action by the latter is more likely to be deferred until next year. A compromise bill, held to meet objections raised to previous measures, will provide for ten-year government loans for industrial establishments requiring financial aid in installing equipment to treat wastes now dumped into streams and rivers.

CENTRIFUGAL compressors are due to receive a major tryout in trunk-line gas transmission service, if present plans of a big line materialize. The compressors will be electric-driven, and will represent a compromise between optimum centrifugal practice and maximum available motor speed.

PRESENT EFFORTS of the State Department to obtain Senate consideration of the Anglo-American petroleum agreement, if unsuccessful, may be the last attempt in that direction. Department officials are ready to admit that if the pact is not brought up this year, it probably never will be.

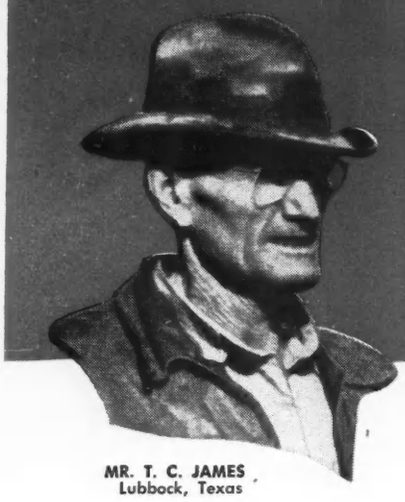
DESTRUCTION of Monsanto Chemical Corporation's Texas City plant may influence plans for a national security synthetic-rubber program, to provide an adequate reserve capacity so that the loss of one or more plants by enemy action, in the event of a war, would not cut too deeply into our rubber production and all that hinges upon it.

CONTROLLED induction heating, which permits any part under heat-treatment to be held at a pre-determined temperature for any desired time, is expected to simplify the hardening of such shapes as drag bits without need for subsequent removal of stress concentration areas.

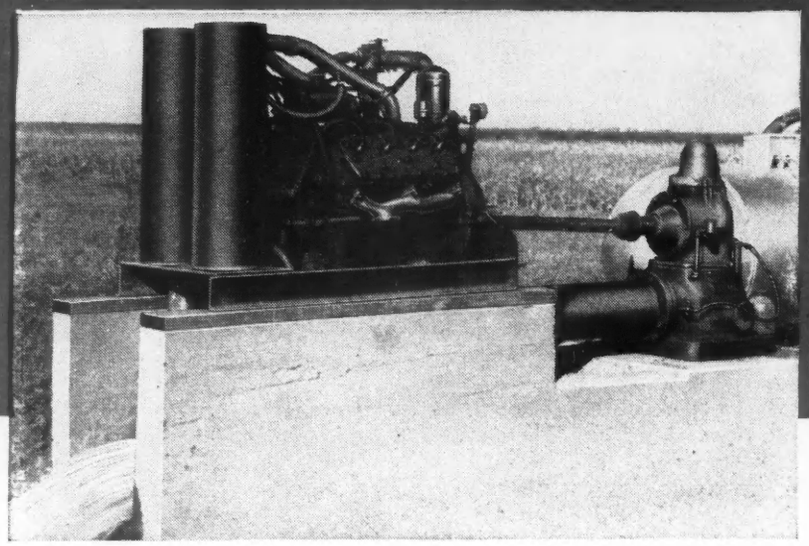
ONE SECTION of a proposed pipe line in the Middle East will use 36-inch pipe, according to present plans. This would be the largest diameter pipe ever used in transporting natural gas or crude oil.

ELECTROSTATIC painting, said to give covering equivalent to brush work with little more than half the paint, offers a method for protecting oil-industry equipment when the process can be adapted to use outside of specially equipped paint departments.

Wouldn't power like this do a real job on YOUR job?



MR. T. C. JAMES
Lubbock, Texas



This Ford V-8 engine has been in continuous service since 1941. It irrigates 125 acres planted to cotton and grain. Average fuel cost is 27 cents per hour, using butane gas.

"10,669 pumping hours—equivalent to 400,000 miles at 40 miles an hour—with only one ring job!"

That's what Mr. T. C. James, Lubbock, Texas farmer, writes from his cost records on this Ford engine.

"Repeatedly, 5 and 6 months at a stretch, day and night, without major maintenance."

And Mr. James adds: "The average yield on dry land farming in this area was one bale of cotton to eight acres. I picked 145 bales off 107 acres!"

A Ford-built engine, properly installed, is an asset in any piece of equipment—from everybody's point of view. It simplifies *manufacturing;* the source of supply is stable and service parts are available the world over. It helps *sell* the equipment, because the whole world knows and respects Ford engines. It is an enduring asset to the man who *buys* and *uses* the equipment, because Ford reliability, simplicity, economy and universal service facilities mean lasting satisfaction. So, whether you build, sell or use engine-powered equipment in the Ford power range, get your copy of the Ford Industrial Engine Catalog.

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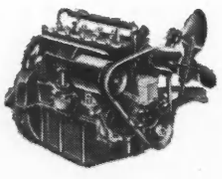
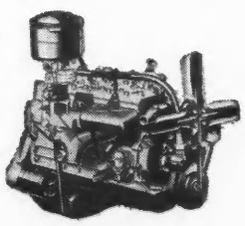
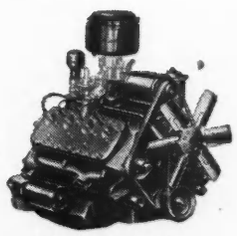


THE 40-H.P. FOUR
119.5 cubic inches displacement



THE 90-H.P. SIX
226 cubic inches displacement



THE 100-H.P. V-8
239 cubic inches displacement

FORD-BUILT ENGINES

PREFERRED FOR INDUSTRIAL AND MARINE POWER

Secondary Recovery Program of Compact

INDICATIONS are that much of the energy of the Interstate Oil Compact Commission in the future will be devoted to development of new methods of secondary recovery and dissemination of such information.

At the Birmingham meeting the Stripper Well Committee, the Engineering Committee and the Research and Coordinating Committee all discussed the problem and the research group proposed that fields be studied from their inception "so that the most efficient means of production can be determined and so-called secondary recovery programs begun long before the field reaches the stripper stage."

Success has been had through water injection in the East Texas field and the Midway, Arkansas, field and gas injection and cycling operations have served to maintain pressures through a long producing life. Concensus at Birmingham was that this method of operation was far more efficient and more likely to insure materially higher ultimate recoveries.

Generally, the compact committees will seek to sustain stripper wells as long as possible as producers, this, the Birmingham view seemed to be, without resorting to governmental subsidy. Thorough investigation will be made of the most skilled operations in the industry and these reports will be passed on to operators whose holdings do not justify a large engineering staff. The compact would employ an engineer of established reputation, he would be given a small staff which would be primarily engaged in the coordination and dissemination of information supplied through engineering staffs of various state regulatory bodies. Details of this program likely will be presented at the summer meeting of the compact.

Another act by the compact dealing with the important matter of secondary recovery took the form of a resolution recommending that each state make a survey of its stripper fields to determine the amount of oil that might be recovered by secondary recovery methods.

* * *

The National Petroleum Council has been cautious in forming its policy and in the future it may have the opportunity to be a bulwark of free enterprise in the oil industry.

W. C. WHALEY, President,
California Oil Producers Agency.

Texas Would Say Farewell to Flares

STEPS taken by Texas operators to remedy waste of gas from oil wells are detailed in a recent report made by Jack K. Baumel, chief engineer of the Texas Railroad Commission.

Since the first hearing held by the commission in 1946 on wastage of casinghead gas, 19 plants have been completed; nine are under construction and will be completed before next January and 39 plants are in the planning stage and probably will be constructed before 1949. Completion of these plants should eliminate the waste of 760 million cubic feet casinghead gas daily that is now being flared. Of this amount it is estimated that 452 million cubic feet will be used in transmission lines, leaving 308 million cubic feet available for daily injection into oil reservoirs for pressure maintenance. The 19 plants completed have stopped 177.3 million cubic feet daily that was being flared.

Gas conservation strides in Texas are further shown by daily average figures below (*gas in thousands of cubic feet*, oil in barrels):

	1939	1946
Oil production	1,305,617	2,070,959
Casinghead gas production	1,730,000	2,744,000
Casinghead gas utilized	768,000	1,555,000
Percentage such gas utilized	44.4%	56.7%
Percentage such gas flared	55.6%	43.3%

Since 1939, Baumel reported, 36 gasoline and repressuring plants have been completed and these plants processed during February, 1947, an average of 374,000 Mcf daily; of this amount, 47,800 Mcf was flared at the plant and 326,200 Mcf was utilized for legal purposes such as light and fuel and repressuring.

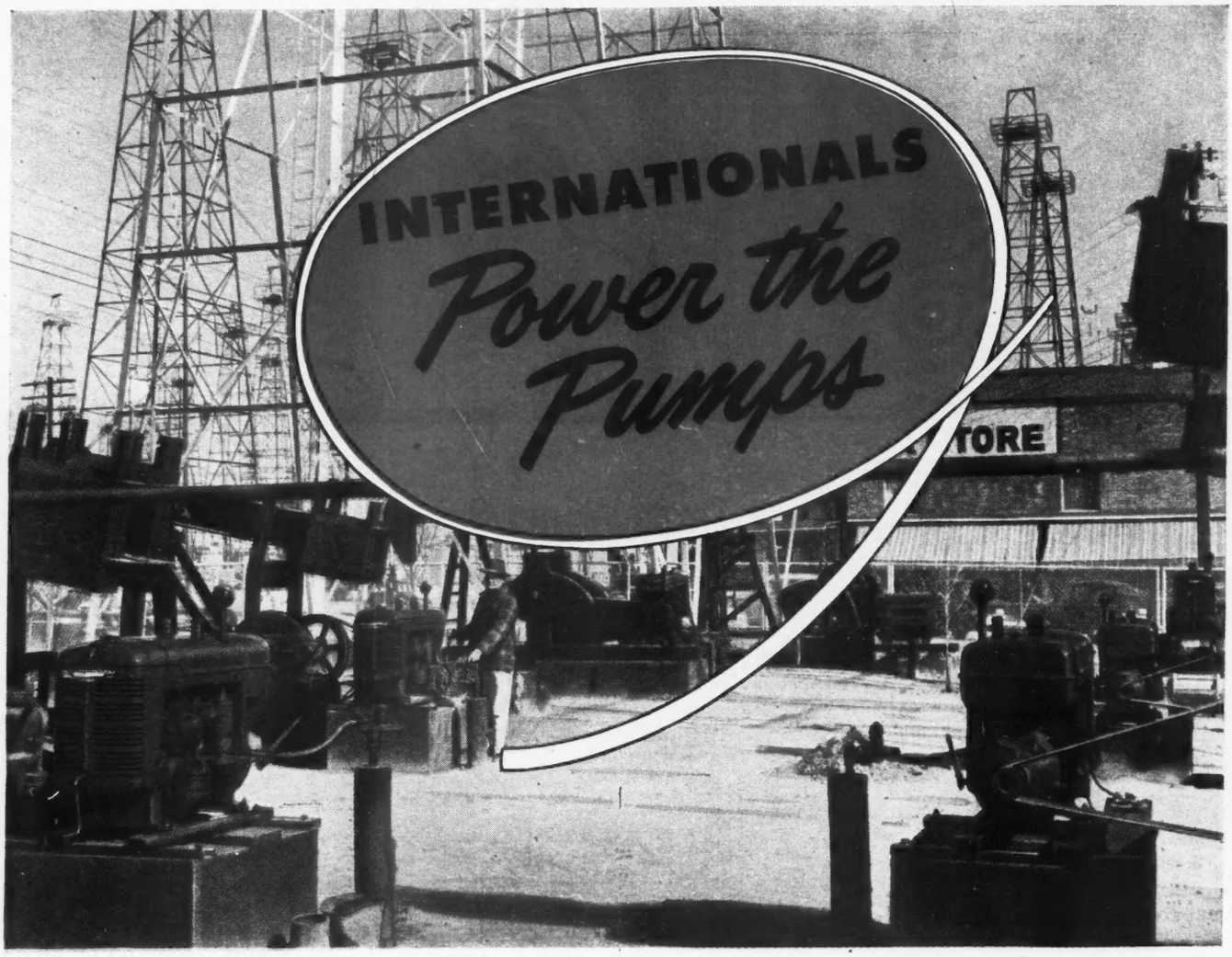
The part one company—Humble Oil & Refining Company—has had in eliminating these gas flares is told by two reservoir engineers in the current issue of *The Humble Way*.

"The first of the two principal methods of reducing the amount of flared casinghead gas is to use those well completion and operating practices which will minimize the amount of gas produced with each barrel of oil," the article states. "This is so closely tied in with efficient production of oil that Humble has used every known means to apply this principle. Its success is shown by the fact that less than 5 percent of Humble production is being taken from wells with gas-oil ratios higher than the field penalty ratio set by the state regulatory body.

"As a result of a survey of all its flared casinghead gas made soon after the war was over, the company has embarked on a far-reaching gas conservation program. The survey showed that Humble was producing approximately 408 million cubic feet of casinghead gas with 210 million cubic feet, or 52 percent, being flared. The 198 million cubic feet utilized reflected results of the prewar program.

"A current summary shows that since the war a definite program has been implemented for complete utilization of gas from 22 fields (nearly all facilities now complete or under construction) which were venting 110 million cubic feet per day."

So real progress is being made toward eliminating gas flares which have so long lighted Texas plains and disturbed conservation-minded citizens of the state.



"Since these units were installed, they have given me very little trouble—no breakdowns and they require little attention."

(Signed) E. J. Gray, Pumper,
Kilgore, Texas

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THE WEEK'S NEWS

THE Federal Power Commission would defer revision of the Natural Gas Act until it reports on its natural-gas investigation sometime next autumn, charging that oil and gas associations were attempting to stampede Congress into action. Story below.

Saudi Arabia Oil Probe—The Senate probe of Navy purchases of Saudi Arabian oil has been broadened to take in all other Federal agencies which have touched the matter at any time. Moffett's proposal to Ibn Saud revealed. Page 29.

Materials Shortages—The NPC committee on material requirements is expected to meet within two weeks to get the facts about existing shortages of pipe, compressors, refinery, equipment, etc. Story below.

OGD Exodus Commences—Failure of the Senate Appropriations Committee to restore funds for the Oil and Gas Division denied by the House is expected to be the signal for Director Max W. Ball to leave the Interior Department. A number of top officials are planning to resign because of congressional hamstringing of their agencies. Page 28.

Tanker Importance—Sudden withdrawal of the 229 government-owned tankers now under charter would create "world chaos" in oil a House Merchant Marine subcommittee was told by Vice Admiral W. W. Smith of the Maritime Commission.

Gas Shortage Feared—FPC officials are seeking early development of plans to minimize natural gas shortages expected to occur next winter in important areas from New York to the Rocky Mountains. Page 30.

ODT Continuance Sought—Continuing shortages of tank cars and other railroad equipment are seen as necessitating continuation of the ODT authority to allocate facilities under the Second War Powers Act.

Asks Support for Interior—Problems raised by the heavy importations of foreign oil were discussed at the annual convention of the U. S. Chamber of Commerce. Resolutions adopted call for government support of foreign oil operators, maintenance of the Bureau of Mines and Geological Survey, return of land tracts, etc. Page 28.

Gas Conservation—Texas is doing something about gas conservation, Col. E. O. Thompson told the natural gas division at the American Gas Association Chicago convention. Page 30.

FPC Wants Natural Gas Act Changes Postponed Until Its Report Is Ready

Deferment of legislation amending the Natural Gas Act until the Federal Power Commission can advise Congress what it ought to do was urged last week by FPC Chairman Nelson Lee Smith.

This theme was the basis of a 52-page statement read by Smith before a Senate Interstate and Foreign Commerce subcommittee besides hearing Smith incorporated in its records the testimony taken last month by the House Interstate and Foreign Commerce Committee, together with a statement summarizing support for the Rizley bill, by Congressman Ross Rizley of Oklahoma, and one in opposition by Tom J. McGrath, representing coal and the railroads.

Smith asserted there has been "seeming haste and urgency" to pass the Rizley-Moore bill, but he conceded that not all of the bill's provisions are without merit and contended it was a realization of the problems raised by the act that prompted the commission's natural gas investigation. Final results of that investigation, he said, should be submitted to Congress in the fall.

Smith denied that a lack of available gas in the fields has anything to do with the shortage in consuming areas, which he attributed solely to lack of steel for construction of additional facilities.

Aside from this, he denied that the industry was in any straits requiring prompt Congressional act. "Far from being in dire straits calling for heroic measures of relief, it would be hard to find a more lusty, growing industry," he said.

The FPC chairman also denied that the recent staff report on state conservation merited IPAA's criticism that it was "impertinent" and "inappropriate" and dealt with matters not of concern to the commission, pointing out that Section 11 (b) authorized investigations and gathering of information.

Smith declared unfounded fears of the oil industry that the FPC desired to extend its jurisdiction to petroleum, explaining that oil was involved in its gas investigation because of interrelationships which made it necessary to conduct the inquiry on a broad scope "as the only means whereby a comprehensive understanding of the problem as a whole could be attained.

The oil industry's apprehensions, he said, will be allayed by an early interpretation which will declare "unequivocally" that Section 1(b) of the act exempts from FPC jurisdiction arm's length sales made by producers and gatherers to interstate transmission pipeline companies.

As to field prices, Smith denied that any recommendations have been made for differentiating between gas produced by pipe-line companies and that of independent producers, but he said price is a problem requiring more searching analysis than it has yet been possible to give.

Since January 1, 1946, applications have been filed for new facilities for 16 existing and five proposed new companies—and much of it authorized—which would just about double the daily delivery capacity, to some 8,450,000 Mcf. Line requirements for authorized construction amount to nearly 2,590,000 tons for the larger sizes alone and, he pointed out, only two mills in the country roll 26-inch diameter pipe and only four are producing 16-inch pipe or larger, with a maximum production capacity of about 1,150,000 tons a year but, because of lack of steel, a current production of probably between 700,000 and 800,000 tons a year.

"Because of the pipe situation last winter's shortages of gas in consuming areas will recur next winter, and the commission is conferring with gas companies and state officials on plans to minimize hardships," he explained.

"The FPC has, and has sought to assert no authority to nationalize, regiment or otherwise dictate the fuel economy of the nation. But, confronted with a situation and not a theory, we were willing to use our good offices in every proper way possible and to assume a role of leadership in a cooperative effort among all concerned to deal with that situation."

While he does not care for the Rizley-Moore bill, Smith was no better disposed toward the Dolliver bill, which would set up a policy safeguarding the interests of the coal industry.

But while the "coal bill" is so indefinite as to leave the FPC without any guide, the "gas bill" is so restrictive that it would hamper the commission, he charged. As an example, the prohibition against end-use restriction, would mean FPC should give no consideration whatever to the nature and extent of proposed markets and make it impos-

NPC Reactivates Group To Study Pipe Shortages

The special National Petroleum Council committee on material requirements has been reactivated and will be called together soon, NPC Chairman Walter S. Hallanan said last week.

At the meeting, expected within two weeks, the committee will seek to ascertain the facts on existing shortage for casing, line pipe, compressors, refinery equipment, land transportation equipment, and other oil industry needs; the probable quantity of such deficiency and the duration of the shortages.

Claude P. Parsons, president, Well Protection, Inc., Houston, is committee chairman.

sible to determine public convenience and necessity, he cited.

"We are not opposing any and all attempts to amend the Natural Gas Act," Smith concluded. "If we held any such smug view we would never have undertaken the evaluation of federal policy and the self-appraisal which is the purpose of the natural gas investigation.

"Questions of federal policy regarding the natural gas industry should be dealt with comprehensively on a firm and rounded basis. Any needed legislation should deal fairly with the problems as a whole, rather than in piecemeal fashion, with priority to some measures pressed by those having a special interest in certain changes. Our full report on the investigation will within a few months give you a sound and helpful basis for your decisions regarding all these questions in terms of the public interest."

Smith said that when the first of the staff reports was released a few gas companies submitted their reactions, but in the main the gas interests responded through a statement filed jointly by the Independent Natural Gas Association, the IPAA, the API and "from the nature and tone of this response it was evident that these trade associations were unwilling to enter into a cooperative consideration of the subject but, instead, had decided to press for legislative action by Congress before the commission's report on the investigation could be finished."

Exodus From OGD Commences

Drastic changes in top personnel in the Interior Department are expected to take place as a result of the refusal of the House to grant funds for certain operations after June 30.

Several of Secretary J. A. Krug's aides already have advised him of their plans to return to private business July 1. Others are waiting to see what the Senate does with the bill passed by the House.

OGD Director Max W. Ball may be among those who will leave the department as a result of the economy drive, unless the Senate restores funds denied by the House which would enable the division to do more than go through the motions of enforcing the Connally Hot Oil Act. Ball took the post at a considerable personal sacrifice with the idea of staying long enough to get the OGD and the National Petroleum Council well launched and then returning to private industry. He probably will stay on until the Senate Appropriations Committee reports the Interior supply bill, showing whether the division can be continued as now constituted.

Fifteen members of the Washington staff of the OGD and one in the field were given 30-day notices of dismissal May 1 and others with considerable earned leave were ordered to take it immediately. At the same time, 17 of the approximately 40 field employes engaged in Connally Act enforcement were put on a leave-without-pay status until it can be determined whether a deficiency appropriation bill just passed by Conngress will permit their retention.

Director Ball disclosed that unless funds are given for activities in addition to Connally Act enforcement, the NPC and all its committees and the Interdepartmental Advisory Committee would have to be liquidated July 1. The financial difficulty will have no effect on the secondary recovery forum meeting scheduled in Washington May 15.

Bradley Murray, OGD organizational consultant, has resigned and on May 15 will join International Bechtel, Inc., one of the contractors on the Arabian American pipe line in Saudi Arabia.

Wescoat Named President, Warner Chairman of Pure

Henry M. Dawes

L. S. Wescoat

Henry M. Dawes, president of The Pure Oil Company for 23 years, was elected chairman of the newly-formed executive committee on April 26. L. S. Wescoat, former vice president and secretary, was named president, and Rawleigh Warner, vice president and treasurer, was elected chairman of the board.

Rawleigh Warner

Comer Plummer, named vice president of production, was manager of the company's Southwestern Producing Division at Tulsa before going to Chicago as assistant general manager of production. R. W. McIlvain, Jr. was named assistant vice president for production. Plummer succeeds R. W. McIlvain, Sr. who was made vice chairman of the executive committee after being in charge of the company's producing operations for 34 years. D. D. Irwin, named vice president in charge of transportation, has been with Pure for 14 years.

Chamber Hears Plea for U. S. Oil Import Policy

A 1946 suggestion of IPAA that federal agencies concerned with oil meet with the authorities of the producing states and the petroleum industry to develop an oil import policy, was revived last week at the annual convention of the United States Chamber of Commerce. Merle Becker, vice president of W. C. McBride, Inc., St. Louis, warned that the domestic oil market might be "captured" by foreign oil.

Wartime development of foreign oil sources, and the pressure upon companies to develop and market oil by foreign governments having an interest in it and in need of money, has resulted in an enormous actual production and a potential of much more, and this excess supply is seeking outlets, McBride explained.

A definite threat that foreign oil in excess of the amount needed to supplement domestic production will be imported will result in a slowing down of exploration work and wildcat drilling by domestic operators, McBride declared.

"The will to destroy competition in American oil does not need to be inspired by malice or implemented by evil intent. The mere exercise of business prudence by companies which hold foreign reserves might well accomplish the evil through market expansion, particularly if stimulated by government encouragement, deliberate or uninformed."

McBride urged that a conference on policy with respect to imports be held as suggested by the IPAA. He favored a tariff equivalent to the difference between the cost of domestic crude or products laid down on the Atlantic seaboard and the cost of laying down foreign crude or products.

Trends in production and reserves over the past 25 years were reviewed for the panel by H. H. Hill, production department, Standard Oil Company (New Jersey), who estimated that domestic crude production will average 4,914,000 barrels daily this year and by 1951 will amount to 5,166,000 barrels.

A number of resolutions dealing with oil problems were adopted at the general meeting of the chamber, one holding that the government should support foreign oil operators but itself refrain from entering directly or indirectly into the oil business. Other resolutions urged the maintenance at high efficiency of the Bureau of Mines and Geological Survey, and called for a speeding up of the government's topographic mapping with a view to covering the entire country within 20 years. The chamber also held that every state should give adequate financial support to a state geological survey "staffed by well-trained personnel, and free from political interference."

The chamber also went on record as believing that all federally-owned "acquired" lands not needed for governmental purposes should be disposed of in fee without minerals reservation.

Scope of Saudi Arabian Navy Oil Deal Investigation Broadened, Brewster Says

The Senate War Investigating Committee's probe of prices charged the Navy by Arabian American Oil Company last week broadened and several members of the committee staff will assist ex-Senator Burton K. Wheeler, special counsel, in investigating circumstances surrounding the company's dealings with the government.

Chairman Owen Brewster of Maine said that other departments involved included Interior, through the activities of the Petroleum Administration for War; State, which was involved in some of the negotiations; War, because the Army uses some of the oil purchased by the Navy, and Justice, which is concerned with legal phases of the contracts.

Both the Navy Department and the company have denied charges, made by James A. Moffett, that the Navy was overcharged $30 million for Saudi Arabian oil.

Moffett's Proposal

A photostatic copy of letters Moffett is alleged to have sent to the minister shows that he offered to double the 22 cents per barrel received from Arabian American Oil Company, and within a year take between 20,000 and 50,000 barrels daily. He also offered to pay an additional 10 cents per barrel for oil delivered aboard ship, plus an export tax of 6 cents, a total of 60 cents per barrel. If delivery could be arranged through Arabian American's pipe lines, he said, 10 cents a barrel should cover the cost and give them a profit. Further, he added, "it would be my earnest desire to pay you an export tax of 20 cents per barrel instead of 6 cents. This would be dependent on the competitive attitude of the British-owned oil companies but it is my firm belief this could be accomplished."

In his letter, Moffett also pointed out that under international law Ibn Saud had the right of expropriation of the company's properties on the basis of their book value, which he estimated at some $60 million and suggested "you might wish to pay them a good will item of $10 or $15 million but you are not obligated to do so."

Assuming it would take $75 million for the new arrangement, Moffett said he would raise $100 to $200 millions, with Ibn Saud to have a 49 percent interest in the company. Production would be expanded to 150,000 to 200,000 barrels daily, and the profits should run from $36 million a year on a 100,000-barrel daily production to double that amount on 200,000 barrels daily, a profit to Ibn Saud of $18 to $36 million a year plus the export tax. This, he said, would be about ten times what was now being received.

The letter was dated February 18, 1946, and eight days later Moffett wrote another in which he disclosed that he intended to make a similar proposition for a Bahrein arrangement on the basis of expropriation of the existing concession, but found it impossible as all deals would have to be "made through the British and they would never permit a liberal offer of this kind to come to their attention," and suggested that the Arabian minister convey the information to the sheikh.

Moffett said Standard of California and The Texas Company had recently discovered a large field in Sumatra and, therefore, "it will be necessary for them to hold back Arabian production which in turn will limit the revenue of the king."

He referred to the then pending Anglo-American old agreement which negotiations he said would be against the interest of the United States and Saudi Arabia, but expressed confidence it would not be approved by the Senate.

"It is unnecessary for me to say that should my offer become known to the interested parties every manner of pressure would be used against me to stop such a deal, even to the extent of attempting to buy me off, which can not be done," he wrote. "The next several months will play an important part in securing the best position possible."

U. S. Crude Oil Production

(Estimates compiled by THE OIL WEEKLY. All figures indicate daily averages in barrels.)

STATE OR DISTRICT	PRODUCTION IN WEEK ENDED May 3	April 26
Alabama	400	600
Arkansas	73,600	74,000
California	910,200	909,500
Colorado	37,800	36,750
Florida	540	550
Illinois	185,700	185,300
Indiana	18,250	18,250
Kansas	276,500	281,200
Kentucky	25,500	26,000
Louisiana	410,900	409,550
North Louisiana	96,700	96,100
South Louisiana	314,200	313,450
Michigan	42,000	43,050
Mississippi	88,300	88,050
Missouri	100	100
Montana	23,000	21,850
Nebraska	600	600
New Mexico	103,885	103,200
New York	13,350	13,100
Ohio	8,700	9,000
Oklahoma	385,800	386,450
Pennsylvania	35,150	34,400
Tennessee	25	25
Texas	2,183,500	2,166,150
Tex. R. R. Comm. Districts:		
Dist. 1—South Central	20,850	20,750
Dist. 2—Middle Gulf Coast	158,330	158,000
Dist. 3—Upper Gulf Coast	481,900	480,600
Dist. 4—Lower Gulf-S.W.	242,370	241,950
Dist. 5—East Central	38,130	38,000
Dist. 6—East Texas Field	335,860	335,000
Dist. 6—Rest of Northeast	111,770	111,500
Dist. 7-B—North Central	37,360	37,000
Dist. 7-C—West Central	36,440	36,350
Dist. 8—West	498,570	485,950
Dist. 9—North	136,660	136,200
Dist. 10—Panhandle	85,260	84,850
West Virginia	7,500	8,000
Wyoming	116,000	115,000
Total United States	4,947,300	4,930,675

Total stocks, foreign and domestic, April 26, as reported by the Bureau of Mines were 235,383,000 barrels.

The President told the committee he could not request permission for its representative to go through the Roosevelt files but had written the attorney for President Roosevelt's executors and requested them to make a search and withdraw any documents, relating to the investigation.

Chairman Brewster said Thursday that counsel would make an "exhaustive study" before further hearings are held. It was indicated that this would be aimed at a determination whether the committee has the legal right to subpoena papers from the Roosevelt files.

A new Senate resolution permits Wheeler to serve the committee without relinquishing his private practice, as required by law.

Technical Papers Slated For PIEA Annual Meet

Program for the Petroleum Industry Electrical Association and Petroleum Electric Supply Association nineteenth annual meeting to be held in Houston May 6 to 8 at the Rice Hotel will include the following papers:

"Two-Way Radio for Petroleum Industry," by R. J. White, Philco Radio Corporation, Kellogg Switchboard & Supply Company, Chicago.

"The XY Switch," by M. A. Clay, Stromberg-Carlson Company, Kansas City, Mo.

"Petroleum Industry Radio," by F. W. Littell, Shell Pipe Line Corporation, Houston.

"New Materials and Their Uses in Design of New Equipment," by F. R. Benedict, Westinghouse Electric Corporation, East Pittsburgh, Pa.

"Prospective Use of Electrical Driven Centrifugal Blowers for Gas Pipe Line Transmission," by W. H. Stueve, Oklahoma Gas & Electric Company, Oklahoma City.

New officers of the two organizations will be elected Wednesday afternoon.

Wright Named Director Of Mississippi Committee

J. K. Wright of Jackson, Mississippi, has been elected director of the Mississippi Oil & Gas Engineering Committee, a position vacated last fall when Alec M. Crowell resigned to join the oil and gas division of the Department of Interior. Crowell recently became affiliated with the Texas Eastern Transmission Corporation.

Wright received a degree in petroleum engineering from the University of Oklahoma and prior to joining the Mississippi Oil & Gas Engineering Committee in 1945 he was with Phillips Petroleum Company and later affiliated with McAlester Fuel Company.

Six Drill Collars Remain In World's Deepest Well

Officials of Superior Oil Company of California last week believed that drilling operations should be resumed within 10 days at the world's deepest test, Weller 51-11, NW NW NE 11-8n-12w, five miles north of Fort Cobb, Caddo County, Oklahoma.

Edwin L. Smith of the Oklahoma City office, said that six drill collars remain in the hole, but that crews have successfully washed open down to a depth of 17,092 feet and hope to "wiggle on down" and pull all tools to a total depth of 17,236 feet.

The crews cut off and pulled the drill pipe.

Price and Public Opinion Are Cited As Factors in Gas Conservation Work

Conservation efforts of state regulatory authorities can go no faster than public opinion will support, Ernest O. Thompson, chairman of the Texas Railroad Commission, told delegates to the meeting of the American Gas Association, Natural Gas Division, in Chicago last week.

At the same time, Hiram W. Dow, chairman, Interstate Oil Compact Commission, called for teamwork between state and industry in meeting the challenge of erasing gas wastage in the air.

"Working together, the gas producing states and the gas industry can eliminate every vestige of criticism, can insure that neither country nor posterity will suffer by reason of our neglect." Dow said.

"Flaring of casinghead oil well gas into the air has always been deemed a waste by people unfamiliar with oil production," Thompson said. "Now, however, even oil country people are getting hot under the collar about it and Texans generally are determined that something must be done about it—and soon.

"We long have had the necessary laws, in my opinion, to prevent gas waste by flaring from oil wells, but only now has public opinion become sufficiently enlightened to become the force sufficiently strong to support conservation of flare gas.

"The public now knows that in some fields this gas can be collected, the liquid hydrocarbons recovered, and the dry gas then compressed to sufficient pressures to return it to the oil-producing reservoir for pressure maintenance.

"Then the public also knows that maintenance of reservoir pressure is necessary in some wet gas fields in order to prevent retrograde condensation by keeping the heavier fractions in suspension so that these valuable light hydrocarbons may be successfuly recovered for use."

Texas Doing Something

When Texas plants or projects now on paper and under construction are completed, utilization of flared gas will be 81.4 percent, which "we believe is indicative of excellent progress in spite of war emergency needs for materials," he said. About 1153 million cubic feet of casinghead gas daily now is being flared in Texas.

"When existing plants or planned projects in Texas are completed," Thompson said, "only 514 million cubic feet will be vented and this will be from isolated fields, where the price of gas it is not economically feasible for us to require the gathering and processing of this gas."

Dow said that today for every 5000 cubic feet of gas that is being sold, 1000 cubic feet is being wasted, the latter almost entirely casinghead gas.

Dow cited the Compact Commission's efforts to promote natural gas conservation, said that "the strength of the Compact lies in enlightened public opinion," but declared that an adequate price is an essential element and inducement for the prevention of waste.

"The limitation of earnings on an oil and gas producer in the great oil and gas producing states to 6½ percent on his producing properties without allowing for discovery value is a regulation that encourages waste," Dow said.

Underground Storage

One of the answers to gas shortages is the use of more underground storage fields, E. G. Dahlgren, assistant secretary, Interstate Oil Compact Commission, said in a paper.

During the past 10 years the use of underground storage has expanded greatly in the United States, Dahlgren said. At present there are some such 70 storage pools, with about 50 located in the Appalachian region.

"It is estimated that the nation's storage areas have a delivering capacity of about 1½ million cubic feet of gas daily," Dahlgren said. "It is also estimated that the storage areas have contained over 120 million cubic feet at their maximum peak, while their maximum practical capacity is estimated at 250 million cubic feet."

Next Winter Gas Supply Subject of Conferences

Federal Power Commission officials will meet in Chicago Wednesday and Thursday with representatives of the Michigan, Ohio, Indiana, Illinois, Missouri, Kansas and Kentucky regulatory commissions, Panhandle Eastern Pipe Line Company and companies purchasing gas from Panhandle to discuss emergency plans for deliveries by Panhandle next winter.

Demand on Panhandle's facilities next winter will substantially exceed its capacity and, due to inability to obtain significant deliveries of pipe this year, there can be no appreciable expansion of its system, making it necessary to continue in some form the emergency rules put into effect last year.

The Chicago meeting is one of a series planned by the commission to discuss the situation with state officials and natural gas companies.

Sonnet Succeeds Berge As Anti-Trust Unit Head

Assistant Attorney General John F. Sonnett, formerly in charge of the claims division of the Department of Justice, took over as head of the Anti-Trust Division, succeeding Wendel Berge, with one of the first matters to come before him being the decision on what to do with the "Mother Hubbard" case, on which the department is due to go into the District of Columbia federal court this week.

Interstate Case Argument Heard by Supreme Court

The Supreme Court is considering its decision in the Interstate Natural Gas Company case, after hearing argument last week.

The case came before the court on appeal by the company from a Fifth Circuit Court of Appeals decision affirming a Federal Power Commission order requiring reductions in rates on gas sold by Interstate in Louisiana to other companies for shipment to other states. The court refused to review the case in January but reversed itself five weeks later.

Involved is the authority of the FPC to regulate the price to be paid for natural gas, produced either as such or in connection with oil. To that end, the company asked the court to decide whether Section 5 of the Natural Gas Act applies to sales within the state of production before delivery to points beyond its border, and whether the sales involved in the case are transactions to which the act applies.

The court's decision will determine whether oil producers may be subjected to FPC control if they sell their gas to pipe line companies.

IPAA Directors to Hear Coulter at Jackson Meet

Dr. John Lee Coulter, economic consultant of the National Association of Manufacturers, will speak at the mid-year directors' meeting of the Independent Petroleum Association of America in Jackson, Miss., May 8-9, on "Oil and Reciprocal Trade Agreements."

The directors will hear discussions on the oil and gas development and possibilities in the southeastern states in papers by Urban B. Hughes, consulting geologist, Laurel, Miss.; Clyde Alexander, Dixie Geological Service, Jackson; Alec Crowell, petroleum consultant, Jackson, and E. D. Kenna, executive vice president, Mississippi division, Mid-Continent Oil & Gas Association.

Other speakers and title of their talks, include: "Elements of a Sound National Oil and Gas Policy," by Senator Joseph C. O'Mahoney of Wyoming; "Oil Industry Public Relations," by Keeton Arnett, vice president, Fred Eldean Organization, Inc.; "The Proposed Amendment to the Natural Gas Act," by Russell B. Brown, general counsel, IPAA; and "Current Problems of the Natural Gas Industry," by N. C. McGowan, president, United Gas Company.

Oklahoma City has been selected for the annual membership meeting of IPAA, dates to be Monday and Tuesday, September 29 and 30.

Correction

In last week's account of tank car movement out of West Texas it, was stated that Atlantic Pipeline Company had restored its 78-car capacity rack adjacent to its Midland station and on April 26 began moving 50,000 barrels daily. The movement should have read "5000 barrels daily," an error having been made in transmission.

Canol Payoff

Best offer for Canol No. 1 out of more than a score of bids submitted to the Office of Liquidation Commissioner last week was $1.5 million for facilities estimated to have cost the government around $70 million during the war.

The bid was submitted by the Northwest Salvage Company, Edmonton, Alberta, and was declared by OLC officials to be "disappointing."

Canol No. 1, declared surplus by the Army last year, consists of the pipe line from Norman Wells to Whitehorse and various other facilities and equipment.

Utah Oil to Construct Another Rangely Outlet

Utah Oil Refining Company will build a direct line from Rangely field in western Colorado to Salt Lake City, President E. S. Holt has announced.

The proposed new line will be constructed with 10-inch pipe and with pumping capacity sufficient to deliver 24,500 barrels daily to refineries in the Salt Lake City area. Delivery of the pipe is expected early in 1948 and it is expected the line will be in operation before the end of next year.

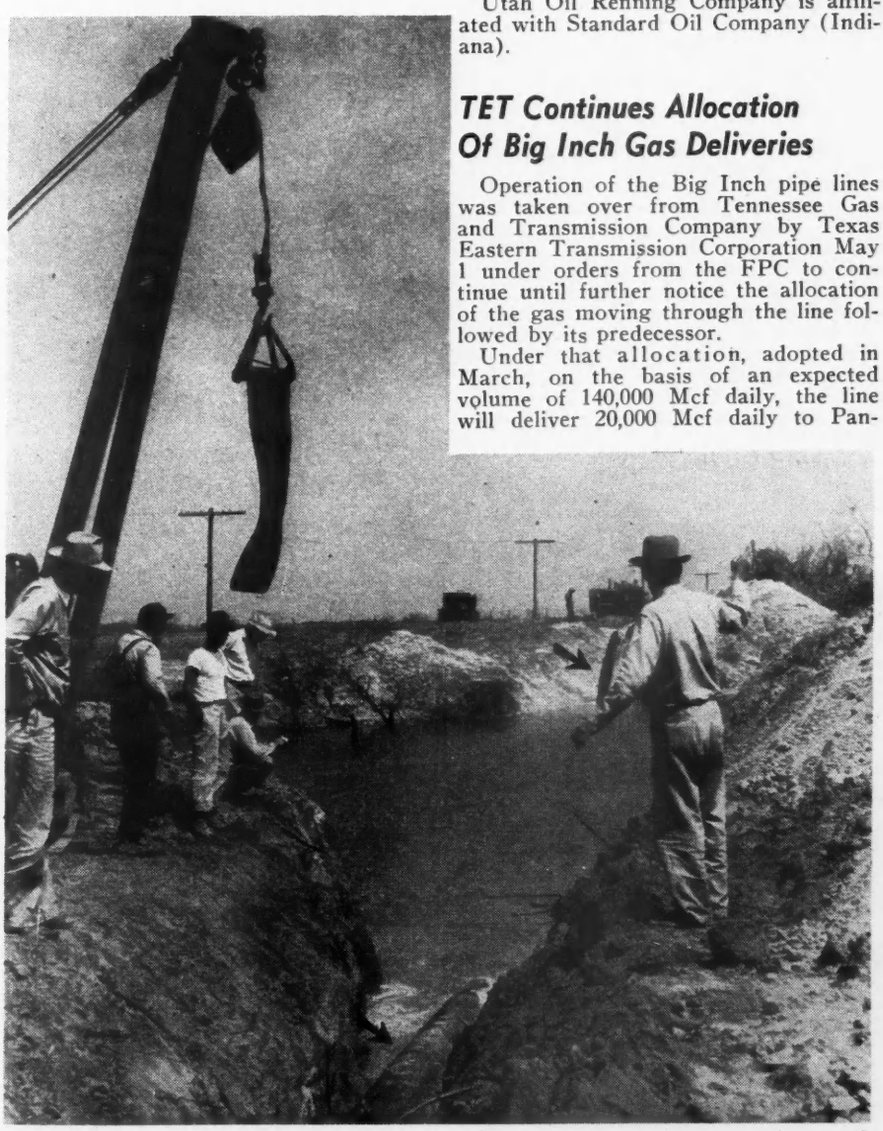
Utah Oil Refining has a 10-inch line from Rangely to Wamsutter, Wyo., with a capacity of 25,500 barrels daily. At Wamsutter this line connects with other Utah lines, one of which is delivering 22,000 barrels of crude oil daily to refineries in the Salt Lake City territory.

Utah Oil Refining Company is affiliated with Standard Oil Company (Indiana).

TET Continues Allocation Of Big Inch Gas Deliveries

Operation of the Big Inch pipe lines was taken over from Tennessee Gas and Transmission Company by Texas Eastern Transmission Corporation May 1 under orders from the FPC to continue until further notice the allocation of the gas moving through the line followed by its predecessor.

Under that allocation, adopted in March, on the basis of an expected volume of 140,000 Mcf daily, the line will deliver 20,000 Mcf daily to Panhandle-Eastern Pipe Line Company; 61,700 Mcf to Columbia Gas and Electric System for distribution to its member companies; 36,300 Mcf to Consolidated Natural Gas System; 14,500 Mcf to National Fuel Gas System; 16,000 Mcf to Equitable Gas Company, and 1500 Mcf to Carnegie Natural Gas Company.



An underwater crossing is made on the Santa Gertrudis Creek in Southwest Texas by Tennessee Gas and Transmission Company's 16-inch natural gas extension line being built from Nueces County, Texas, to the San Salvador field in the Rio Grande Valley. This line is being built for TGT by Associated Contractors and Engineers and is 70 percent complete. Arrows point to the 16-inch line as it is pulled across the creek.

Anahuac-Baytown Line Being Built by Humble

Humble Pipe Line Company is building a 31-mile 3-inch distillate line between Anahuac, on the Texas Gulf Coast, to Humble Oil & Refining Company's refinery at Baytown. Construction is being done by J. R. Stewart Construction Company. Humble Oil & Refining Company is building a natural gasoline plant in the Anahuac field that will process between 35 and 40 million cubic feet of gas daily.

The Stewart company has almost completed for Humble Pipe Line Company 8.07 miles of 8-inch crude line between Webster Station, Harris County, Texas, to Humble's refinery at Baytown.

Feeders Nearly Ready

Interstate Oil Pipeline Company is about to complete its feeder lines that will connect the LaGrange and Carthage Point fields in Adams County, Mississippi, with the Cranfield field station from which the oil is transported to the Baton Rouge refinery. Plans call for 18 miles of 6-inch pipe from Cranfield to LaGrange and from there 8 miles of 4-inch pipe to the Carthage Point field.

Increased Deliveries Asked By Kentucky Gas Company

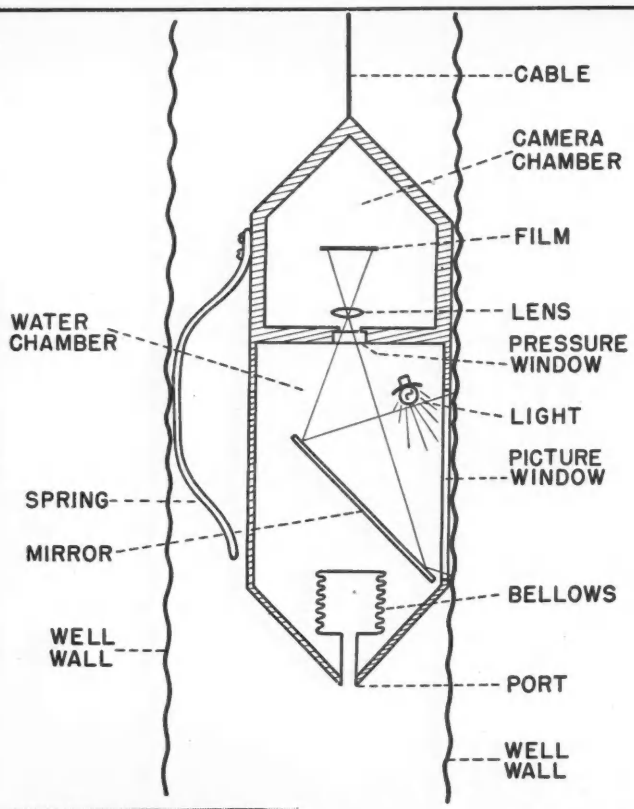
Central Kentucky Natural Gas Company has filed application with FPC for construction of 23 miles of 24-inch transmission line between Foster, Ky., and a line to be constructed by Cincinnati Gas and Electric Company from the west side of the Ohio River to the Cincinnati area, at a cost of $1,933,000, to increase by 31,200 Mcf daily its deliveries to the Cincinnati company and its subsidiary, Union Light, Heat and Power Company.

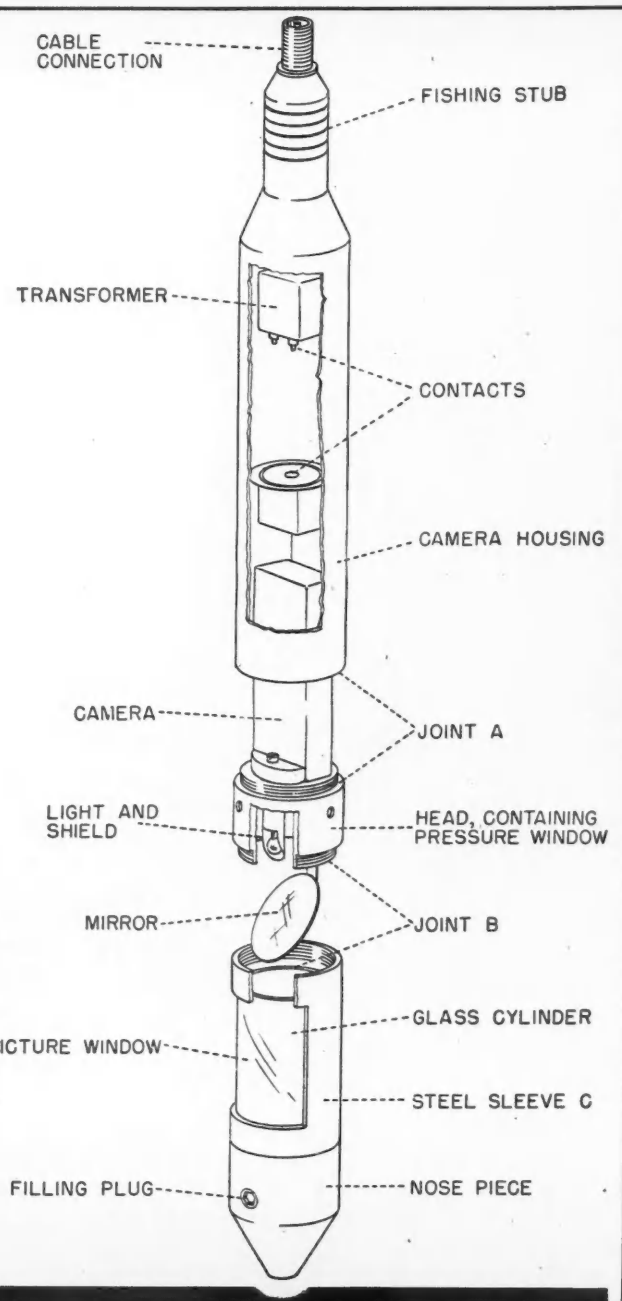
Interstate Loop

Interstate Oil Pipe Line Company is reported planning to install a 17-mile 10-inch loop on its system between Liberty Station, Amite County, Mississippi, and Baton Rouge terminal in Louisiana. Interstate now has a 12-inch line between the two points, and the new loop will increase the capacity of the line to 100,000 barrels daily.

Ohio Construction

East Ohio Gas Company is laying 50 miles of 20-inch natural gas line between the Jackson storage area, Stark County, Ohio, to their main line system in the southwest suburbs of Cleveland. This line was authorized last year by FPC.





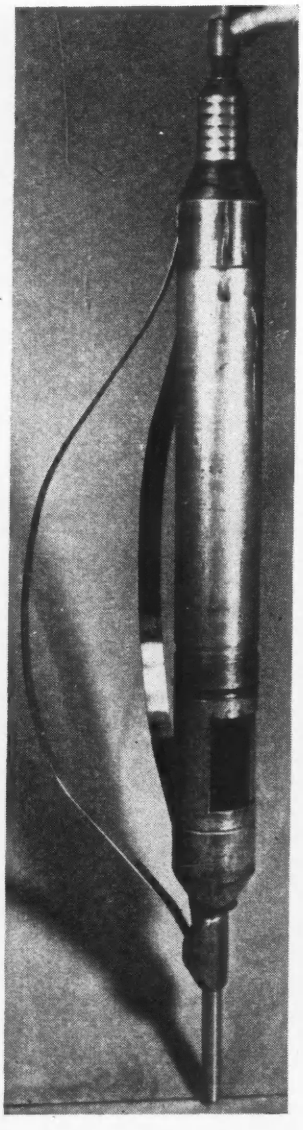
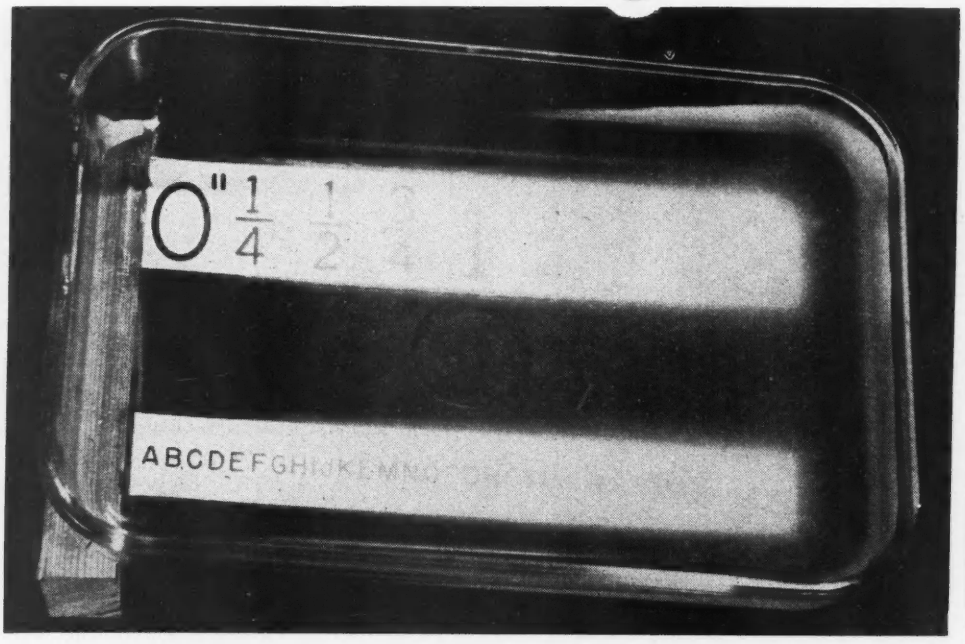


Figure 1 (upper left). The general principles of operation of the deep well camera.

Figure 2 (upper right). General construction and arrangement of parts.

Figure 3 (lower left). The camera assembled and ready to go into a well. This view shows the "push-over" springs which hold the camera's picture window close to the wall of the bore hole.

Figure 4 (lower right). The effect of depth of turbid well fluid on the sharpness of the picture. Figures on the inclined scale represent inches immersion of the scale in the murky water.



Deep Well Camera

By O. E. BARSTOW
and C. M. BRYANT
Dowell Incorporated,
Tulsa

SOME of the most interesting applications of photography are those in which things that could not otherwise be seen are made visible. Deep well photography is such an application. The subject dates back at least to 1907, for in that year J. T. Atwood,[3,4] of Wisconsin University invented a photographic device with which he was able to take pictures in a well under water at a depth of 200 feet. In 1918, Dilts[5] applied for a patent on a subterranean camera for photographing lost tools in a drilled well and also for photographing the earth and rock formations. In 1924, Reinhold[6] described an improved camera designed to minimize the thickness of well fluid between the camera lens and the formation to permit taking pictures in relatively dirty water. He and also Opocensky[7] further provided for displacing the opaque or turbid well fluid near the camera by means of a stream of clear water.

This paper describes an improved deep well camera, tells how it is used, shows photographs obtained with it, and finally points out possible future developments in the field.

Figure 5. A Bell and Howell 16 millimeter camera fitted with a solenoid release for use as a deep well camera.

FIGURE 1 shows schematically the optical system and general principle of operation of the camera. For clarity, the dimensional proportions of Figure 1 have been somewhat distorted. Figure 2 is a cut-away drawing, more nearly to scale, giving a better idea of how some of the parts are constructed and arranged, while Figure 3 is a photograph of the exterior of the assembled apparatus.

The camera is run into the well on an electric cable which serves to transmit the power required by the apparatus and to provide remote control of the camera from the surface. As shown in Figure 1, the apparatus consists of two main parts: a camera chamber and a water chamber. The camera chamber contains air at atmospheric pressure and houses the camera including lens, film and film-drive mechanism. It must be strong enough to withstand the external pressure of several thousand pounds per square inch encountered in deep wells.

The water chamber, which is filled with clear water, is used merely to provide a bath of clear liquid between the lens and the rock formation being photographed, an idea originally proposed by Reinhold. The water chamber houses a light to illuminate the subject and an inclined mirror which permits the camera to view the wall of the well horizontally through the cylindrical picture windows in the side of the water chamber. The bellows shown in Figure 1 serves to equalize the internal and external pressures on the water chamber so the picture window can be relatively large without encountering difficulties due to high pressure. In the bulkhead at the top of the water chamber is a pressure window immediately below the camera lens. This window must withstand full well pressure, but this is a comparatively simple matter because the window diameter can be small.

Attached to the outside of the case is a spring which pushes the picture window against the well wall, thus minimizing the thickness of turbid well fluid through which the picture must be taken. This spring also assists in keeping the camera stationary during exposures. The importance of pushing the camera close up against the formation is illustrated in Figure 4. Here, one end of a shallow glass baking dish has been blocked up about two inches above the table and the dish filled with water made turbid by the addition of a little aquagel. A scale on the bottom of the dish is nearly invisible at one end but becomes progressively more distinct as the water depth decreases from two inches to zero. The scale figures denote actual immersion depth. In this case, water which would be murky enough to blot out the picture completely at a distance of two inches from the picture window would permit reasonably clear photographs to be made at ¼ or ½ inch. By pushing the picture windows against the formation, satisfactory pictures have actually been made in water so turbid that a sample of it in a pint milk bottle completely obscured any vision through the bottle. It is, however, always an advantage to have the well fluid as clear as possible. This is particularly true where

Presented at the ASME meeting, Tulsa, March 4, 1947, by O. E. Barstow[1] and C. M. Bryant.[2]

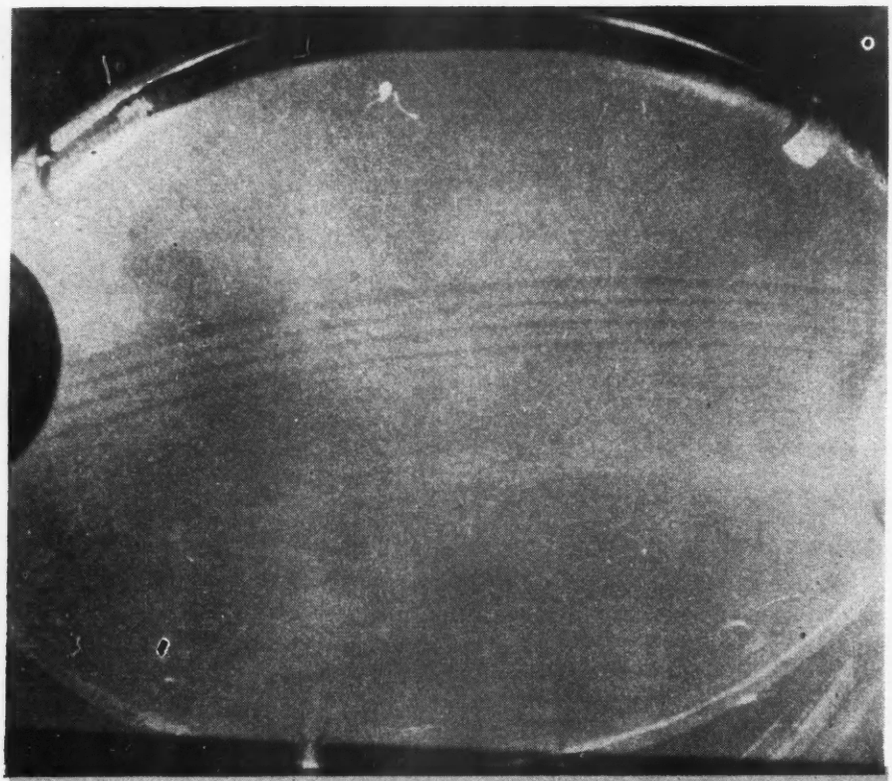
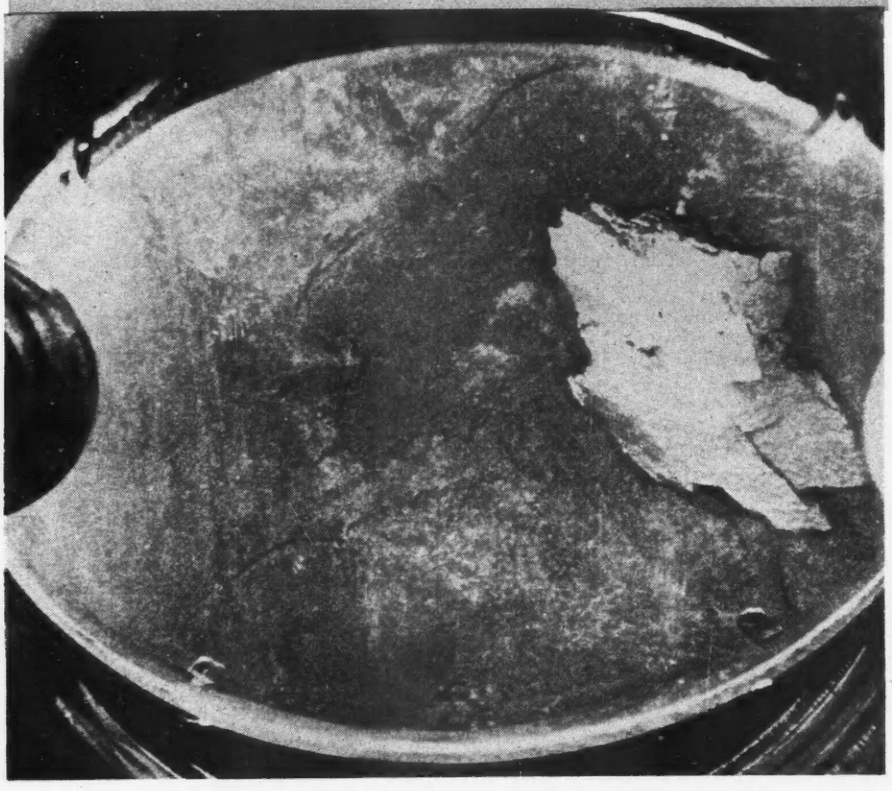


Figure 6. A section of the casing at 2361 feet, 8 inches which contains a collar.

Figure 7. A fragment of gypsum that may be actually included in the rock, although the shadows around the edge would seem to indicate that there is a possibility that the fragment is just adhering to the wall of the well (2429 feet).



there may be difficulty having the camera fit up tight against the formation or where the well wall may be rough and irregular.

The diameter of the water chamber is, of course, limited by the diameter of the smallest well in which the apparatus is to be used. Making the water chamber large is an advantage, because this provides a large picture window and increases the area of the well wall which is photographed. Also, the greater the diameter of the cylindrical picture window the better it will fit up against the rock, thereby improving the pictures in case the well fluid is turbid. Making the water chamber fairly long is also an advantage, since this increases the distance from lens to subject, increasing the depth of field. This facilitates sharp focusing even when the well wall is irregular with various parts of the formation at different distances from the picture window.

The camera requirements are not severe. The camera's field angle should be wide enough so that the extent of the subject covered is limited only by the mirror or picture window. Due to refraction at the pressure window the subject appears to the camera to be only three-fourths as far from the camera as it actually is. The lens is focused accordingly and permanently locked. To increase the depth of field, the lens may be stopped down to f/16 or smaller. No shutter is needed, since exposures can be made by turning the light on the desired exposure time, then turning it off while forwarding the film and shifting the camera to the next location. The camera must have enough film capacity so that frequent reloading is not necessary and the film drive mechanism must be controlled electrically.

The light or lights must be located to give satisfactory illumination of the subject without undesirable reflections from window and mirror, must be shielded from the camera lens, and must be able to stand the well pressure.

Description of Equipment

Figures 2 and 3 show the actual construction of one of these cameras. The glass cylinder forming part of the water chamber is 4 inches outside diameter by 4½ inches long by ¼ inch thick. It is surrounded by a steel sleeve having a rectangular opening about 3 inches wide by 4½ inches high in one side forming the picture window. The ground ends of the glass are sealed by means of neoprene gaskets against the steel head and steel nose piece which are screwed into the steel sleeve. These joints are subjected to only small differential pressures because of the equalizing action of the bellows in the nose piece. Attached to the head is the glass mirror making an angle with the vertical somewhat less than 45 degrees. The mirror is shaped elliptically to fit inside the glass cylinder. The back surface is silvered. In the top of the head is the glass pressure window sealed with a thin rubber gasket to withstand the high pressure in the water chamber. This window is ½ inch thick by 1⅛ inches in diameter with an unsupported diameter of ¾ inch.

The head carries two G. E. Number 1129, 21 c.p. automotive type lamps which are operated on 6 volts 60 cycle A.C. These lamps were found to withstand the high external pressures satisfactorily. Using distilled water in the

chamber with lamp contacts and connections insulated from the water, the leakage current was found to be negligible, and no bubbles due to electroyltic decomposition of the water could be observed. The exact position of the lights and the shape of the reflectors and shields were chosen to give good illumination of the subject while avoiding reflections in the mirror and glass cylinder which might otherwise show up as bright spots in the picture. Tipping the mirror somewhat steeper than 45 degrees also helped to eliminate these reflections.

The camera is screwed to the top of the water chamber head with its lens directly above the pressure window. The camera housing slides down over the camera making a pressure-tight threaded connection with the water chamber head. This joint is the one that is taken apart whenever the camera is loaded or unloaded. The camera housing, which is 4-3/16 inches outside diameter with a 3/16 inch wall, was tested with an external pressure of 2500 pounds per square inch. The camera housing and water chamber are zinc-plated inside and out for corrosion resistance.

The Camera

The camera itself shown in Figure 5 is a revamped Bell and Howell Model 151 magazine-loading 16 mm movie camera with a 7.4 mm by 10.3 mm frame size. This camera has a builtin feature permitting it to take single exposures like any still camera. The control button has been coupled to a solenoid for remote electrical control. The power for driving the film still comes from the camera's spring motor which will give 450 exposures on one winding. A 15mm focal length lens is used and provision has been made for stopping the lens down as small as f/32 if desired for greater depth of field. At f/32 an exposure time of eight seconds is satisfactory when using negative panchromatic safety film.

The upper end of the camera housing is threaded to make a water-tight connection to the socket on the end of the electric cable. Below this connection is a "fishing stub" to facilitate retrieving the camera from a well in case of accident. A transformer fixed in the upper end of the housing provides the six volts required by the lights. When the housing is in place, two spring contacts below the transformer engage contacts on the upper end of the camera providing connections to camera and lights.

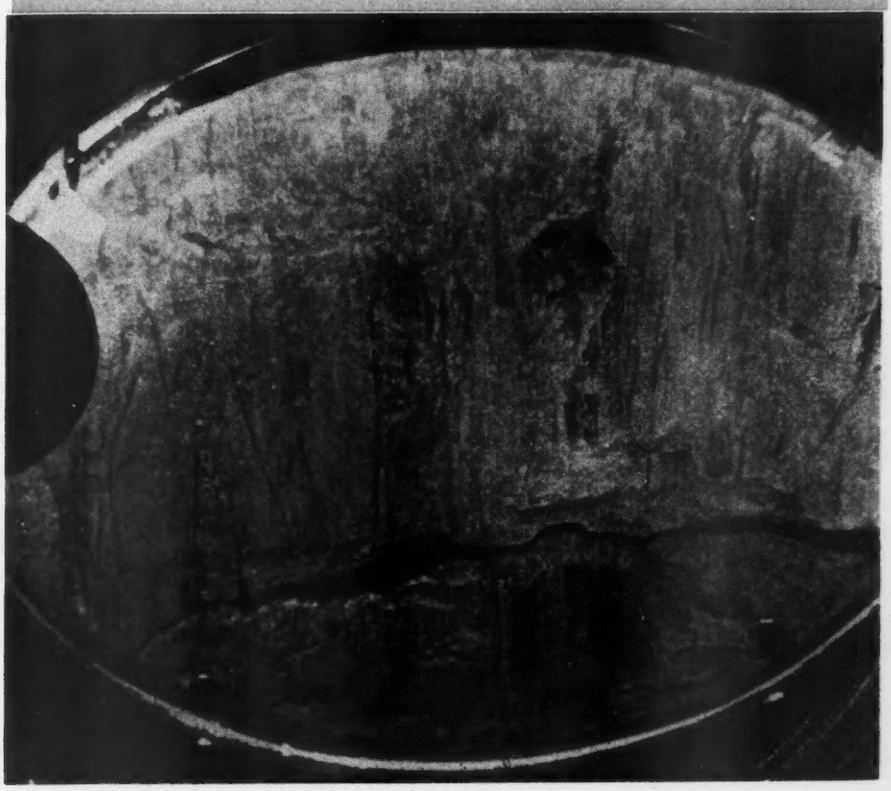
Two springs (see Figure 3) with their upper ends fixed to the camera housing and their lower ends attached to a sliding block hold the camera against the formation in wells up to 12 inches diameter. By removing the springs the camera, which is 4-3/16 inches diameter, can be used in a hole as small as 4½ inches diameter.

For comparison, it might be noted here that the camera model preceding the one described above used an Argus Model AF,35 mm camera with electric motor drive requiring a case with an outside diameter of six inches. Use of this camera was limited to large diameter wells. A further handicap was the fact that only 36 exposures could be made without reloading.

When a well is to be photographed, it is first necessary to determine the type of fluid covering the section of formation where the pictures are to be taken. Most

Figure 8. A well-developed porous zone on right side of picture. This cavity may be due to enlargement of a fracture by leaching. Entire section shows considerable amount of porosity as evidenced by small openings that appear all through picture. There is one small stylolite traversing picture beginning in the upper part on the right and extending across picture to join another small fracture on left. (2528 feet.)

Figure 9. Example of well-developed stylolitic zone which has been leached out by action of subsurface fluids. Vertical striae may be due to presence of stylolites running transversely to the one which appears in bottom of picture. The phenomenon of a leached stylolitic zone is interesting because in some limestones these serve as reservoirs of commercial deposits of oil. (2559 feet.)



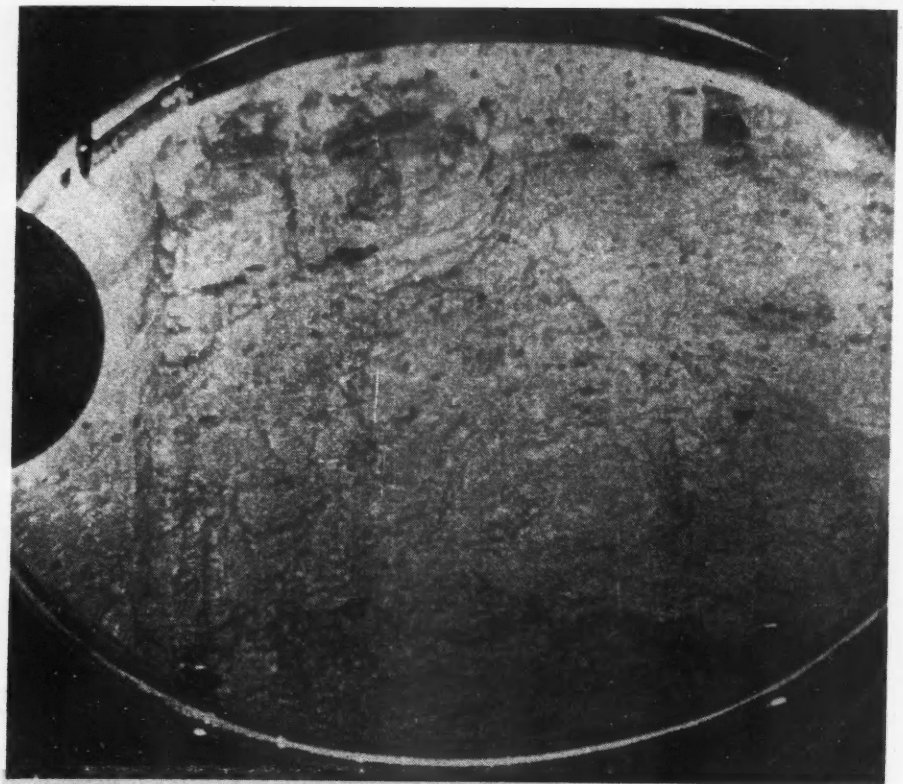
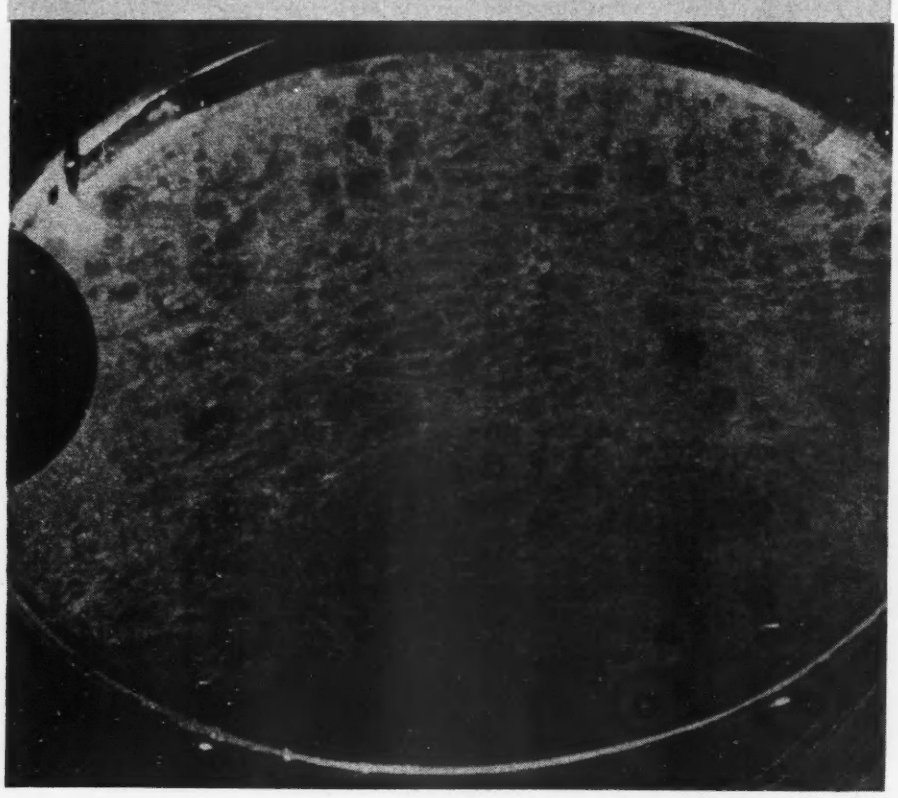


Figure 10. Some very fine porosity is in upper half of picture and a leached stylolitic zone is at bottom of picture. There seems to be a distorted zone, near top of picture, which may have been caused by movements of the sediments while they were in a clastic state. (2676 feet.)

Figure 11. A well-developed primary porosity. Primary porosity may occur in all types of limestones but generally the pores are not connected and rocks of this type do not generally make good reservoirs. (2678 feet.)



wells which produce formation water will have reasonably clear fluid covering the formation. If there is some doubt as to the type of fluid in the hole, a sample can be obtained by running a thief or bottom hole sampler. If it turns out that the hole is filled with oil or water too turbid for good pictures, it will be necessary to replace the well fluid with a relatively clear fluid. This is easily accomplished by spotting the clear fluid, usually salt water, in the well bore through tubing. The tubing is then removed from the well in order to run the camera.

In case the well is flowing it should be killed before attempting to run the camera. By using a clear fluid to kill the well, it is possible both to kill the well and condition the bore hole so that optimum conditions exist for the taking of pictures, in one step.

On wells that have a layer of oil on top of the clear fluid covering the section to be photographed it is necessary to cover the window of the camera with a material which is very soluble in water but insoluble in oil. This is done so that any drops of oil that might cling to the window of the camera will be released when the material dissolves in the water and thus the window will be clean when the camera reaches the section of the well which is to be photographed.

Operating Equipment

The equipment used to operate the camera includes a special non-rotating stranded steel cable, the core of which is a rubber-covered electrical conductor. The metal sheath of the cable serves as the path for the return circuit. This cable is attached to a hoisting winch which has commutator rings enabling the cable to be raised and lowered in the well bore without breaking the electrical circuit. A portable 110 volt A.C. generator and an instrument panel containing a voltmeter and an ammeter with suitable control switches for operating the camera are also provided. This equipment is all mounted in a large panel-bodied truck so arranged that the truck motor drives the hoisting winch. The depth of the camera in the well bore is determined at all times by running the cable over a measuring wheel which is connected by selsyn motors to a depth counter on the operating panel of the truck.

After the well bore conditions have been determined and corrected if necessary, the camera is loaded with the film and attached to the cable. Each roll of film is identified by taking a photograph of a card containing the roll number, date, well name and other pertinent data. This is done before the camera is lowered into the well and serves also as a check on the electrical circuit and the operation of the camera and lights.

The camera is lowered into the well at a rate of approximately 50 feet per minute. When the camera reaches the well section to be photographed, it is stopped and an exposure is made by operating the surface controls. The correct exposure time depends on the lens stop setting and the type of film being used, and generally amounts to a few seconds. With the present cameras, the exposure time is controlled from the truck by the length of time that voltage is applied to the cable. This can be done with a manually operated switch or with an automatic time switch.

Two types of picture surveys are

(CASE HISTORIES OF TWO DECADES AGO . . . *No. 8 of a Series*)

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. . . *as it does today!*

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Then 5,305 feet was their deepest hole. Today, the new record is now below 17,000. Since 1927, Patterson-Ballagh Casing Protectors have played a very important part in making drilling records. Such evidence is proof of the benefits of rubbering every joint in your string. See your Patterson-Ballagh man and gain the many advantages of 100% protection for your drilling operation.

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made: One, a continuous strip photograph of the well bore showing every inch of the formation, and the other a series of single shot pictures spaced at intervals of one foot, five feet or any other desired interval. Usually the one-foot interval is used. The continuous strip picture is made by lowering the camera only two inches between exposures and then using only the center section of each print. The prints are fitted together to make a continuous picture of the well bore in much the same manner that aerial photographs are fitted together to make photomaps.

Figures 6 to 12 are examples of some photographs taken in a well in West Texas. The formation is the San Andreas section of the Permian lime in the Hendricks Pool. More than 400 pictures were taken in this well at depths of from 2300 to 2725 feet. When the pictures were taken, the well fluid was within 200 feet of the top of the well.

Future Developments

In some gas wells, the collection of dust on the picture window during the descent of the camera may present a difficulty not encountered in liquid-filled wells. To overcome this difficulty a camera has been built with an extra steel sleeve which slides over the water chamber and camera housing covering the picture window. When the camera reaches the point in the well where pictures are to be taken, the sleeve is released electrically and slides down far enough to bring a hole in the sleeve into register with the picture window. This device appears very workable but has not been field tested.

A new, very compact camera has been built which is electrically driven, uses 35 mm. film, and takes 500 pictures 24 mm.x36 mm. with one loading. These are more than three times the dimensions of the pictures taken with the 16 mm. camera. The new camera fits into the same 4-3/16-inch diameter case as the 16 mm. camera. It has not been field tested.

In the discussion of the general principles involved in the design of these deep well cameras, it was pointed out that the use of as large a water chamber as the well bore would permit was an advantage because the size of the area photographed at each exposure could thereby be increased, and also because a better fit between picture window and well bore could be attained. A logical step in this direction might be to build a series of water chambers of different diameters with the upper heads designed to connect to the same standard small diameter camera housing.

Reinhold[6] ran his camera into shallow wells on a string of tubing and was thereby able to orient the camera to take pictures in any desired direction, this direction being indicated on the film by a compass located in the field of views of the camera. To orient the apparatus when supported by a cable is somewhat more difficult. Even with a slight deviation of the axis of the bore hole from the vertical there is a strong tendency for the camera to twist around so that it consistently faces the low side of the hole with the "push-over" springs facing the high side. Pictures taken in the same well on different trips usually show the same views because of this tendency of the camera to orient itself. Many schemes have been suggested for taking pictures in all radial directions in the bore hole. One that looks promising is to use a cylindrical or bowl-shaped picture window extending completely around the circumference of the water chamber, omitting the mirror and using a very wide angle camera lens. Another method would be to substitute for the plane mirror a cone-shaped mirror or a submarine periscope-type mirror with its axis vertical. The distortion produced by such a mirror could be cancelled out by using the same optical system in reverse for projection printing or projection viewing of the developed film. One rather simple method of taking pictures in different directions would be to use a plane 45-degree mirror as in the present cameras, but provide a means, perhaps a motor or a solenoid, for rotating the mirror progressively a small amount around a vertical axis each time the film is advanced.

Figure 12. Pay zone section of the well. Also shown are some very large openings together with well-developed smaller openings, most of which are confined to the lower one-third of the picture. Perhaps some of this porosity may have been formed by the leaching out of the remains of living organisms such as corals. Some of the apparent distortion around the large openings may have been caused by the growth of the reef structure (2719 feet).

Stereoscopic Pairs

Related to the above problem is the one of taking pictures in stereoscopic pairs for stereoscopic viewing. The sense of perspective afforded in this way should be useful in studying porosity, cleavages, and general structure of the formation. The usual method of taking the two views from slightly different lens positions would be applicable here. In this case, rotating the mirror is equivalent to shifting the lens position. Thus for stereoscopic pairs it would be necessary only to take two separate pictures at each camera location, rotating the lens through a small fixed angle between the two exposures.

Another idea offering real possibilities is the one of replacing the photographic camera by a television camera transmitting to the surface where the subject viewed by the camera would be immediately and continuously visible on a screen. This subject has been thought about by many people. Wired television techniques now being employed industrially for observation of remote locations should be applicable here. A concern[8] specializing in such equipment is now engaged in developing a deep well television device. It is believed that with present television tubes and techniques such a development is entirely feasible. The deep well camera has been developed to the point where it can be of very practical value in examining bore holes. Developments in the near future should make it even more valuable.

REFERENCES

[1] Dow Chemical Company.
[2] Dowell Incorporated, Tulsa, Oklahoma.
[3] Eng. Min. Jour. Press, p. 944, May 18, 1907.
[4] Haddock, "Deep Bore Hole Surveys and Problems," 1931 p. 176, McGraw-Hill.
[5] John B. Dilts, Paul, Idaho, U. S. Patent 1,331,627, "A Subterranean Camera."
[6] Thomas Reinhold, Chief Geologist of the Geological Survey Department of Holland. See Haddock, "Deep Bore Hole Surveys and Problems," 1931 p. 179, McGraw-Hill. See also British Patent 226,079 and U. S. Patents 1,658,-537 and 1,790,678. See also Colliery Engineering p. 371, August, 1926. See also Mining and Metallurgy, February, 1932.
[7] Willard J. Opocensky, Long Beach, California, U. S. Patent 2,161,380, "Subterranean Camera." See also U. S. Patent 2,203,176, "Time Controlled Subterranean Camera."
[8] Diamond Power Specialty Corp., Detroit, Michigan.

Co-ops SEEK WORLD OIL CARTEL

By WALTER BISCUP

About the Author

ARTICLES by Walter Biscup, Oklahoma newspaperman, have appeared throughout the country in magazines, books and anthologies. He has devoted many years to research and his writings have influenced political and social thought in his state. His series of articles on syphilis, nationally reprinted in 1936, brought revision of Oklahoma's health laws. A year later his series on the FBI's technical laboratory, prepared in Washington, D. C., brought to public attention for the first time this newly-developed phase of scientific crime detection and won the public approval of Director J. Edgar Hoover. The oil industry will remember him for his coverage of the Madison, Wis., anti-trust trials. His most recent series concerned the proposed Arkansas Valley Authority and received wide national circulation. Biscup spent many months in assembling facts on co-op activities and his original article on "Cooperatives" has been reprinted in the Congressional Record.

Walter Biscup

Biscup was born and reared in China, came to the U. S. in 1920 and was educated at Oklahoma A. and M. College and the University of Missouri. He has been a member of the Tulsa World editorial staff for 21 years.

CONSUMER cooperatives in the U. S. are doing an annual $12 billion business tax-free.

More than 1,700,000 members belong to 4646 consumer cooperatives and the number is increasing daily. As recipients of special favors from the federal government they are collectively becoming the keystone in a gigantic economic arch which is spanning the globe.

The economic theory of cooperatives is that of social organization based on collective ownership and management of the production and distribution of goods. They aim to replace competition and the system of free enterprise.

Cooperatives can, and do, cater to public wants ranging from the cradle to the grave, manufacturing 32 different lines of goods and offering a variety of special services, all tax-free. They are progressing so rapidly that they could well dominate all business in the country in the coming generation.

Today the cooperatives are planning a world-wide oil cartel to be managed by a world-wide petroleum cooperative. Howard A. Cowden of Kansas City, Mo., president of the Consumers Cooperative Association, the largest in the petroleum field, outlined the program last November before an international co-operative conference in Zurich, Switzerland, and revealed that the authorized capital of this cooperative will be $15 million. Cowden told his fellow-workers:

"It (the cartel) will start modestly as a broker of petroleum, moving gradually into every phase of the industry."

Despite its comparatively small capitalization, the cooperatives' oil cartel is a serious threat and should not be treated with complacency by the oil industry. A current brochure of the CCA declares:

"Today, world cooperation in petroleum is here. Tomorrow, or the day after, a world cooperative."

Cowden's plans should not be minimized, as his record proves him a person of singular ability, especially in the cooperative field where, within 18 years and beginning with only $3000 in capital, he built up the largest oil cooperative in the U. S.

The history of cooperatives here and abroad, as well as the history of our tax legislation necessarily must be taken into consideration before a proper evaluation can be made of this movement.

100-Year-Old Movement

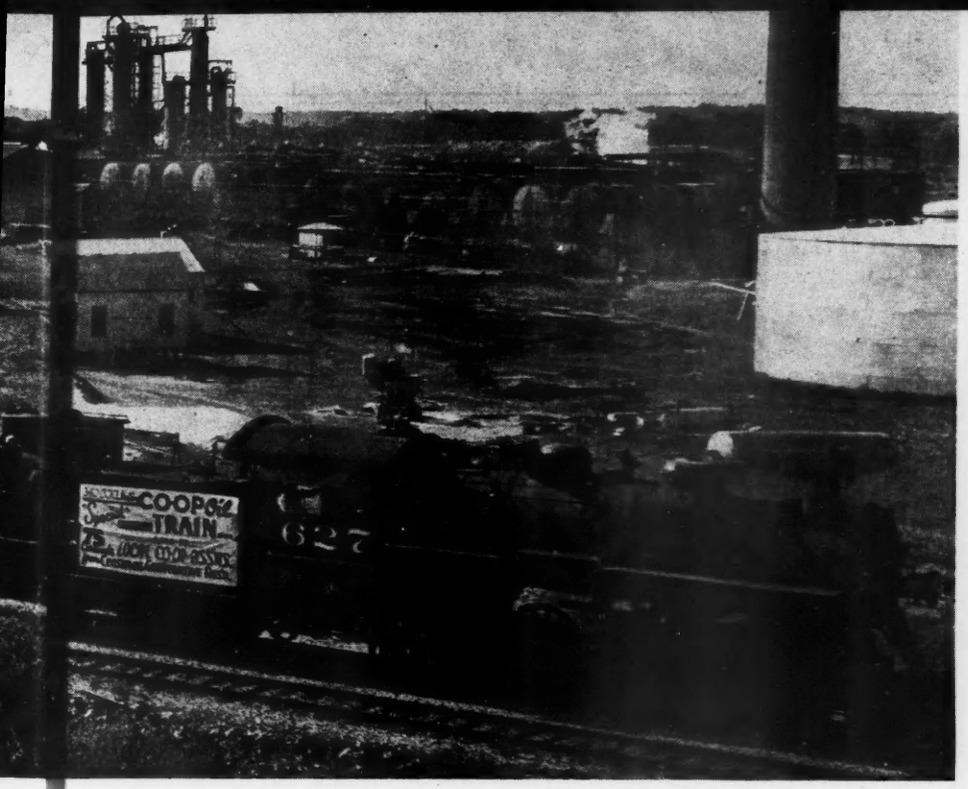
The modern consumers' cooperative movement is more than 100 years old. During that interval the idea has spread all over the world and today there is hardly a country without some sort of cooperative. In Asia and the Far East credit cooperatives usually have predominated. In agricultural countries farmers have banded together in cooperatives. In Europe before the war an official census showed more than 800,000 cooperatives of various types with an estimated membership of 145 million.

Consumer cooperatives in the U. S. today provide goods as follows:

Groceries, meats, clothing, shoes, dry goods, furniture, bakery products, coal and wood, dairy products, electrical appliances, hardware and other household supplies, drugs, cosmetics, luggage, gasoline, other fuels (kerosine, etc.), motor oil, grease, tires, tubes, batteries, and other automotive accesories, paint, lumber and building materials, flour, feed and seeds, fertilizer, farm supplies, automobiles, trucks, sports goods, caskets and funeral supplies as well as miscellaneous articles of a minor type.

Services rendered by cooperatives include:

Automobile repair, barber, cold storage, beauty parlor, educational courses and facilities, funerals, funeral contracts, la ndry and dry cleaning, houses and apartments, insurance agencies, medical care, medical care contracts, passenger transportation, meals, shoe repair, study clubs, printing and publishing, automobile storage, rooms, social and recreational facilities, tailoring, auditing and accounting, water for family use, parking



Part of a mile-long train loaded with co-op oil as it left Coffeyville, Kansas, September, 1946. The train of 75 cars was shipped from a cooperative refinery at Coffeyville by the Consumers Cooperative Association, one of the largest oil co-ops in the world. The train was run in two sections and distributed oil and grease to co-ops in nine midwest states. CCA announced that this was the first of a series of shipments.

Tulsa World, Tulsa

lots, greasing and tire repair, steam heat, credit facilities, electrical contracting, trucking, facilities for airplane flying and services not otherwise classified.

Cooperatives have successfully competed with private oil companies because of exemption from federal income and excess profits taxes.

Petroleum cooperatives attained their industrial majority shortly before the last war and they have rapidly expanded their activities into the production and refining fields. The CCA was organized in 1929 with a capital of $3000. At the end of the first year it had done a business volume of $309,890.70, and had made net savings of $5221.40. It then began to compound lubricating oil, manufacture grease and also established a paint factory. The first cooperative-drilled well was completed October 11, 1940, near Laton, Kansas. In 1942 it built its first petroleum refinery at Phillipsburg, Kansas, (3500 barrels), and laid the first crude gathering pipe line (70 miles) ever owned by a cooperative in the U. S. In 1941 CCA purchased a 1500-barrel refinery at Scottsbluff, Neb. In 1943 the CCA and four other regional cooperatives bought a 17,500-barrel refinery at McPherson, Kansas, and a 229-mile pipe line to Council Bluffs, Iowa. On January 1, 1944, CCA bought the 13,500-barrel refinery at Coffeyville, Kansas, including a lube plant which produced more than 20 million gallons of motor oil in 1945-46.

Last December CCA bought control of Bridgeport Oil Company of Wichita, Kansas. On January 1 of this year the cooperative paid several million dollars for the Coralena Oil Company of Tulsa, thereby acquiring 189 producing wells in Kansas and Oklahoma and 20,000 acres of developed and undeveloped leases. Bridgeport owned 99 wells, two rotary rigs and 65,000 acres of leases. In March of this year CCA acquired the government-built refinery at Coffeyville (1665 barrels) for $1,200,000. The refinery originally cost in excess of $4½ million.

During the last fiscal year Cooperative Refinery Association, the oil producing and refining subsidiary of CCA, announced it had four refineries, 867 miles of pipe lines and 448 producers in Illinois, Kansas, Oklahoma and Texas.

Including developed as well as undeveloped leases, CRA holdings now cover more than 100 square miles.

During this 12-month period CRA produced 1,641,676 barrels of crude. This was 30.7 percent of the 5,345, 383 barrels processed at the refineries at Coffeyville, Phillipsburg and Scottsbluff.

CCA's financial statement for the year ending August 31, 1946, showed net earnings of $1,665,298.82. Refineries showed the biggest profits at $1,124,726. Net worth amounted to $9,550,264.84. Total assets were listed at $16,453,161.21.

No payment of federal income tax is shown, though a regular corporation that made $1,665,298 would be paying $632,000 at the present rate of 38 percent.

Net savings of CRA (including crude procurement), in 1946, were $1,124,726 against $1,175,541 the year before. Crude runs by refineries totaled 5,345,383 barrels against 5,637,216 barrels the year before, a decrease of 291,833 barrels resulting from a tight crude market.

Crude run in the Coffeyville refinery last year was 3,835,801 barrels as compared with 4,167,828 barrels in 1945. Production of refined fuels, exclusive of lubes and heavy fuel oil, was 92 million gallons. Production of lubes for the last two years has approximated 19 million gallons a year.

Construction work on the furfural and vacuum units of this plant is going forward. The furfural unit should start polishing lubes early this spring and the vacuum unit probably will start production of desirable lube stocks and roofing paper flux shortly after. Cost of these improvements is $1,161,382.

The crude throughput at the Phillipsburg refinery was 1,117,409 barrels; output of refined fuels has been about constant the last two years, approximately 29 million gallons a year.

Crude runs at the Scottsbluff refinery was 392,173 barrels, an increase of 45,621 barrels over 1945. Production of refined fuels was slightly under 11.5 million gallons.

For the third straight year CCA produced in its own refineries enough refined fuels to meet the needs of its members. However, the problem of supplying CCA members with about 200 million gallons of refined fuels annually was not a simple matter and in order to supply member associations most advantageously the past year, CCA had exchange agreements with a score of oil companies, including both majors and independents.

Five-Year Plan

The CCA has announced a five-year plan and the goals include:

1. A total of 1500 member associations, serving 500,000 families in 3000 communities, doubling the present number of families.

2. At least 100 communities in which all farm and home supplies will be furnished by CCA.

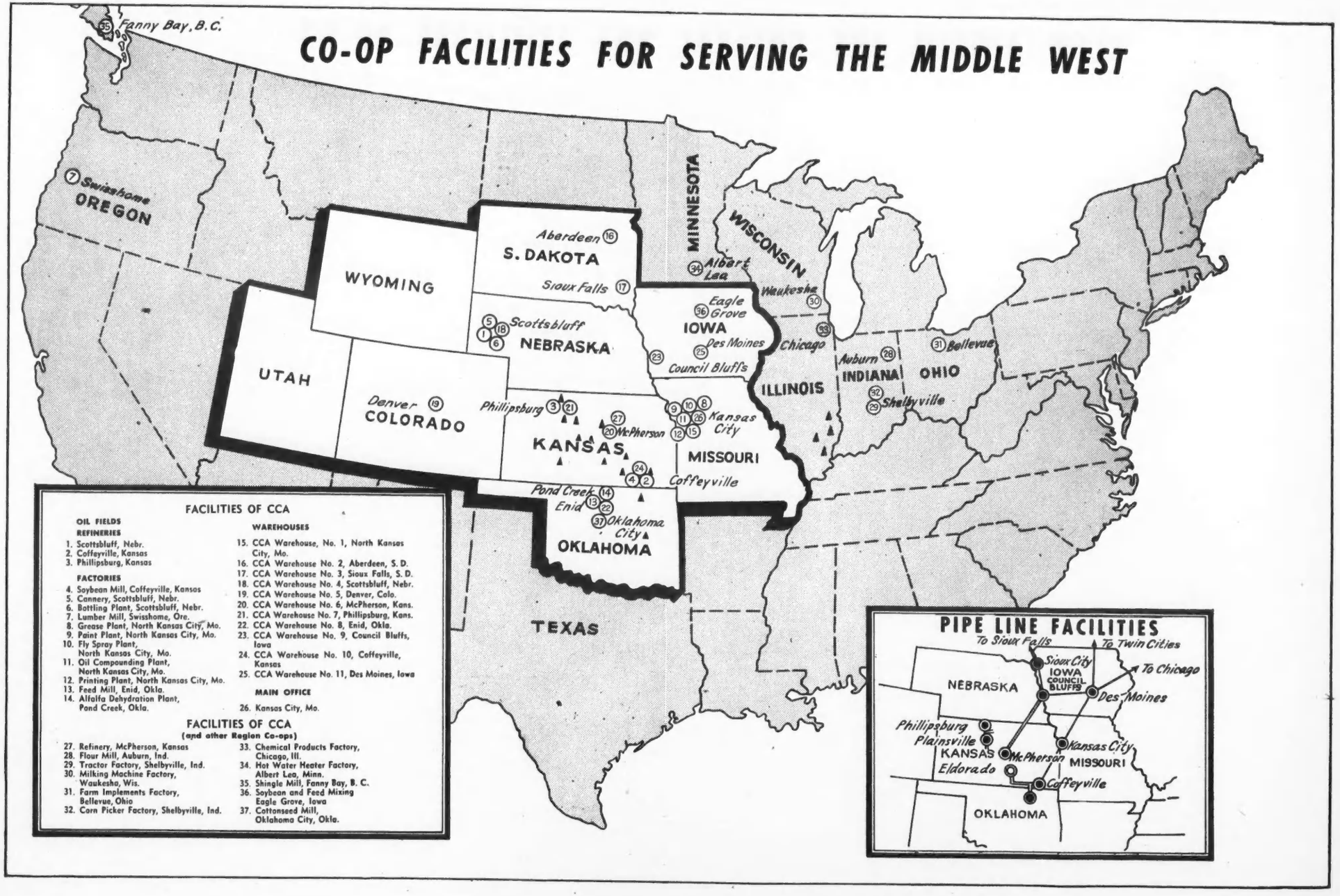
3. A weekly co-op newspaper with 300,000 circulation; regular radio broadcasts; a School of Cooperative Leadership with buildings and faculty; job training for managers; summer camps for youth.

4. A $104 million volume of business, and $30 million of capital from deferred patronage dividends, patrons' equity reserves and sale of preferred stock.

5. At least 70 percent of all goods handled to be produced or processed in CCA's own or jointly owned co-op plants, including tires, batteries, roofing, cement and fertilizers.

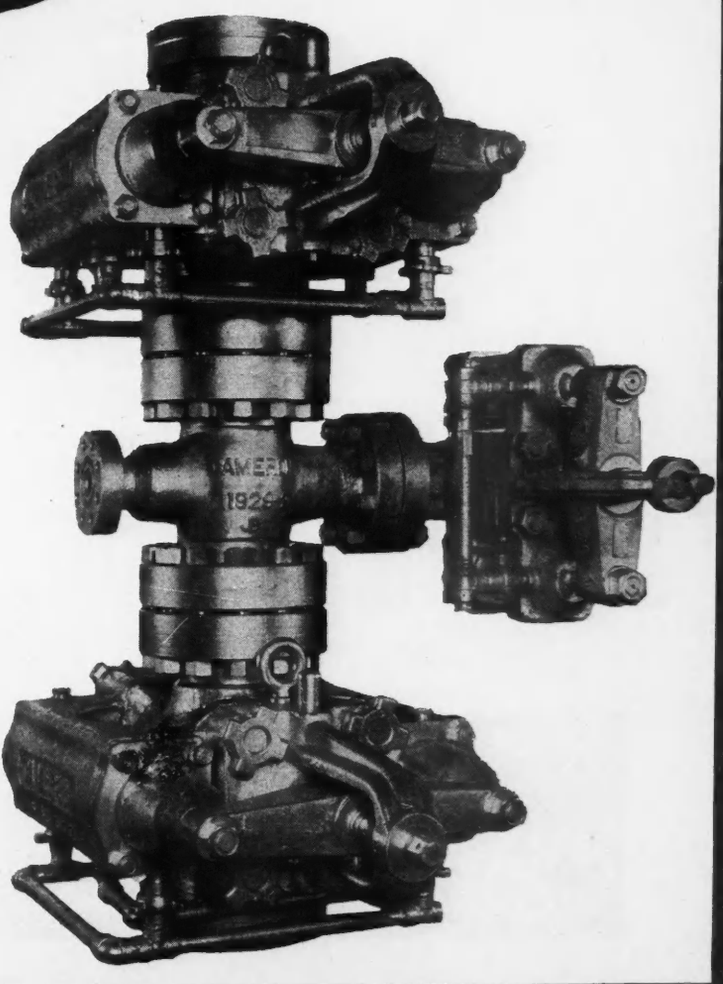
Cooperatives have found that the greatest profits in the petroleum industry accrue from productive rather than distributive activities. Since competitors found it difficult to expand or establish reserves for future expansion because of the increasing tax burden, cooperatives were able to purchase productive enterprises and pay for them out of non-taxed profits from petroleum and other business activities in a relatively short time.

Because dollars saved through tax exemption represent much of the investment in new facilities, it is reasonable to conclude that cooperative ownership is indirectly paid for by all taxpayers. An illustration of this effect is provided by the record of 14 major cooperatives which had combined earnings of $10,-383,177 during the fiscal year of 1942. They would have paid approximately $6,582,943 in federal income and excess profits taxes at the average rate paid by private industry (63.4 percent). Instead, this and additional funds, amounting to $7,285,073, were retained in the capital structure and, therefore, were available for expansion. The rest of the non-taxed net earnings, $3,098,104, was returned


CO-OP FACILITIES FOR SERVING THE MIDDLE WEST
Fanny Bay, B.C.
Swiashone
OREGON
WYOMING
Aberdeen
S. DAKOTA
Sioux Falls
MINNESOTA
Albert Lea
WISCONSIN
Waukesha
Eagle Grove
IOWA
Des Moines
Council Bluffs
Scottsbluff
NEBRASKA
Chicago
UTAH
Denver
COLORADO
Phillipsburg
KANSAS
McPherson
Kansas City
MISSOURI
Coffeyville
ILLINOIS
Auburn
INDIANA
Bellevue
OHIO
Shelbyville
Pond Creek
Enid
Oklahoma City
OKLAHOMA
TEXAS
FACILITIES OF CCA
OIL FIELDS
REFINERIES
1. Scottsbluff, Nebr.
2. Coffeyville, Kansas
3. Phillipsburg, Kansas
FACTORIES
4. Soybean Mill, Coffeyville, Kansas
5. Cannery, Scottsbluff, Nebr.
6. Bottling Plant, Scottsbluff, Nebr.
7. Lumber Mill, Swisshome, Ore.
8. Grease Plant, North Kansas City, Mo.
9. Paint Plant, North Kansas City, Mo.
10. Fly Spray Plant, North Kansas City, Mo.
11. Oil Compounding Plant, North Kansas City, Mo.
12. Printing Plant, North Kansas City, Mo.
13. Feed Mill, Enid, Okla.
14. Alfalfa Dehydration Plant, Pond Creek, Okla.
WAREHOUSES
15. CCA Warehouse, No. 1, North Kansas City, Mo.
16. CCA Warehouse No. 2, Aberdeen, S. D.
17. CCA Warehouse No. 3, Sioux Falls, S. D.
18. CCA Warehouse No. 4, Scottsbluff, Nebr.
19. CCA Warehouse No. 5, Denver, Colo.
20. CCA Warehouse No. 6, McPherson, Kans.
21. CCA Warehouse No. 7, Phillipsburg, Kans.
22. CCA Warehouse No. 8, Enid, Okla.
23. CCA Warehouse No. 9, Council Bluffs, Iowa
24. CCA Warehouse No. 10, Coffeyville, Kansas
25. CCA Warehouse No. 11, Des Moines, Iowa
MAIN OFFICE
26. Kansas City, Mo.
FACILITIES OF CCA
(and other Region Co-ops)
27. Refinery, McPherson, Kansas
28. Flour Mill, Auburn, Ind.
29. Tractor Factory, Shelbyville, Ind.
30. Milking Machine Factory, Waukesha, Wis.
31. Farm Implements Factory, Bellevue, Ohio
32. Corn Picker Factory, Shelbyville, Ind.
33. Chemical Products Factory, Chicago, Ill.
34. Hot Water Heater Factory, Albert Lea, Minn.
35. Shingle Mill, Fanny Bay, B. C.
36. Soybean and Feed Mixing Eagle Grove, Iowa
37. Cottonseed Mill, Oklahoma City, Okla.
PIPE LINE FACILITIES
To Sioux Falls
To Twin Cities
Sioux City
IOWA
COUNCIL BLUFFS
To Chicago
Des Moines
NEBRASKA
Phillipsburg
Plainsville
Kansas City
KANSAS
McPherson
MISSOURI
Eldorado
Coffeyville
OKLAHOMA

THE PETROLEUM ENGINEER, February, 1947
WELLS 12,000 FT AND DEEPER
United States 318
Canada 4
Venezuela 2
Ecuador 1
Germany 1
Total 326
WYOMING 1
COLORADO 2
NEW MEXICO 1
OKLAHOMA 8
TEXAS 66
LA. 144
MISS. 6
ALA. 1
FLA. 4
CALIF. 64
• Tests below 12,000 ft.
+ Wells producing below 12,000 ft.
Deep exploratory wells on increase
AND SIX new wells were
below 12,000 ft in 1946
tal of deep wells in this
he number for 1946 was
66 per cent more
than those drilled in
1945, striking evi-
VE
trend in the search for petro-
the depth record was broken
he break was slight and the
deepest core ever taken. The well was
drilled speedily and without a fishing
job until it hit the record depth and got
a record fish.
Much more important was the new
record for deep production. The present
deepest production, discovered in 1946,
is Shell Oil Company No. 2 Smith-State
Unit 1 in the Weeks Island field, Iberia
Parish, Louisiana. The well was drilled
to 14,301 ft and is producing from 13,778
apart. It has been interesting through
the years how faithfully production has
followed the deep drill. In 1935 when the
first well went below the 12,000-ft mark
to 12,786 ft, the deepest production was
from 9836 ft, a difference of 2950 ft,
which is a little more than it is now.
Wells 12,000 ft and deeper according
to years are given in Table 1. The plan
of going down below that level caught
on in 1938 and remained fairly steady

BEWARE OF BLOWOUTS



As a rule, the number of wild wells increases in proportion to the increased activity in wildcat or exploratory drilling . . . with emphasis on the "deep exploratory wells." Since experience has proved that the deeper the well, the higher the pressure, the reason for such a trend is obvious. Consequently, it is sound practice to be prepared for any eventuality before digging into the unknown.

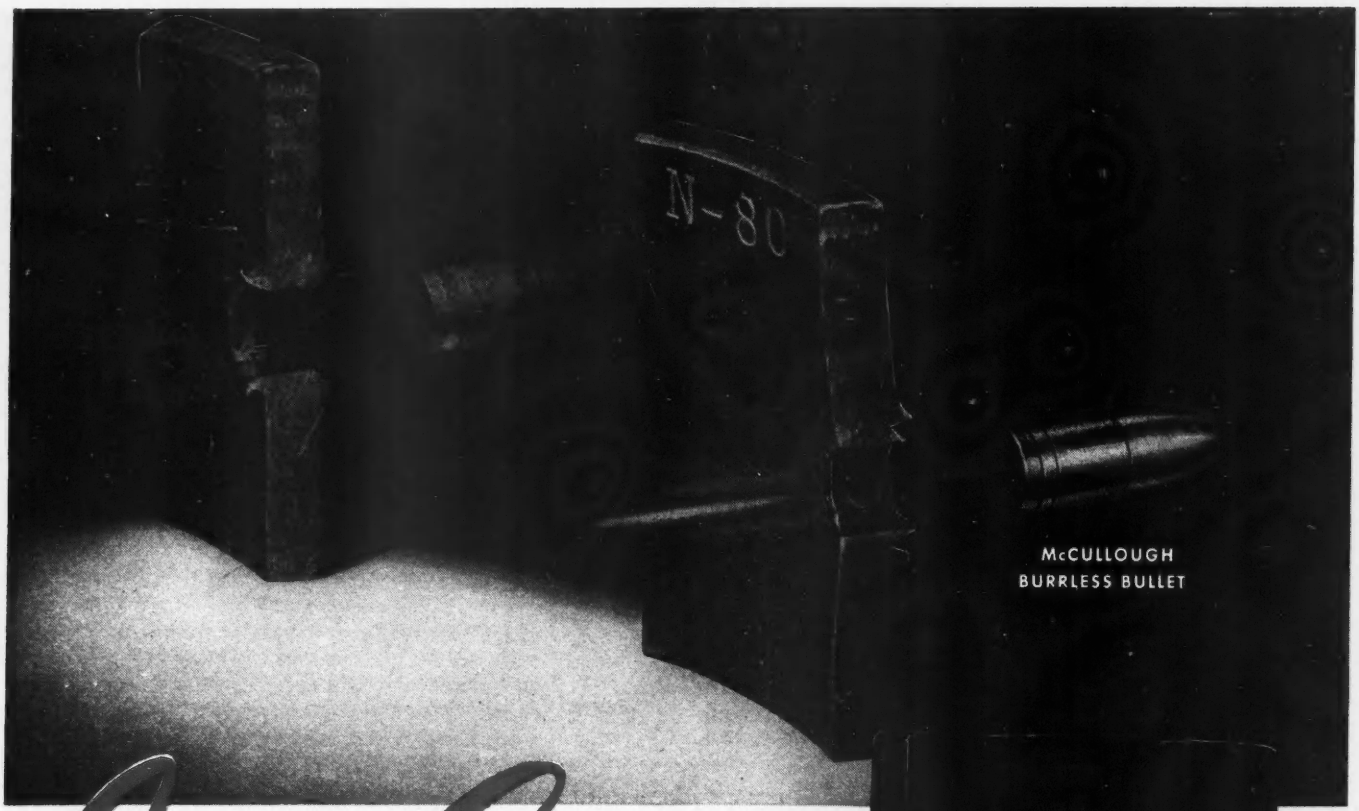
Latest contribution to this kind of preparedness is Cameron's new pressure-operated, high closing ratio, blowout preventer and gate valve . . . the type "QRC" preventer and type "HCR" valve illustrated at right. When used in an assembly—one "QRC" with pipe rams, one "QRC" with blind rams, and an "HCR" valve on the flow-line—they form the world's best team for safeguarding a drilling well.

While most operators are familiar with the blowout preventer design—its quick ram change, more favorable ratio of closing pressure to well pressure, low overall height and reduced weight, 10,000 lb. test models in 6", 8" and 10" sizes, etc.—the "HCR" valve was introduced more recently. It was designed as a companion to the "QRC" preventer, employing the pressure by-pass to equalize well pressures in front and behind the gate and thus obtain the same high closing ratio as with the "QRC" preventer. Otherwise, the time-proven features of the earlier model Cameron pressure-operated valve, the type "DV", are generally retained.

CAMERON IRON WORKS, INC.

P. O. BOX 1212 • HOUSTON, TEXAS

Export: 74 Trinity Place, N. Y. West Texas: Odessa, Telephone 1710. Oklahoma: 310 Thompson Bldg., Tulsa. California: 1442 Hayes Ave., Long Beach (7-2036). Wyoming: 356 N. Wolcott St., Casper. North Louisiana: Bossier City (P. O. Box 425).



Just Compare...

McCullough's BURRLESS BULLET!

...the first bullet to give both burr-free holes and full projectile efficiency. The unretouched photographs on the right–N-80 casing, 7⅝", 39 lb., perforated simultaneously by McCullough's BURRless Bullet and a regular bullet–show you more clearly than a thousand words that the McCullough BURRless Bullet gives you a perforation completely free from inside burr, eliminating the need for casing scrapers, preventing any possible damage to swabs or packers, saving you tool rental, saving you rig time, saving you money.

Another McCullough Special Service—no extra cost!

McCullough PUTS THE SHOTS WHERE THEY COUNT

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CALIFORNIA: LOS ANGELES, AVENAL, BAKERSFIELD, SACRAMENTO, VENTURA, SANTA MARIA
LOUISIANA: HOUMA, LAKE CHARLES, NEW IBERIA, SHREVEPORT KANSAS: ULYSSES WYOMING: CASPER

EXPORT OFFICE: 30 Rockefeller Plaza, New York 20, N. Y.

to the patrons in the form of cash dividends and stock.

The evolution of the "petroleum super cooperative" is similar to that followed in other fields and represents the attainment of a major step in the program to control the production and distribution of petroleum products from their source to the ultimate consumer. This expansion into production and refinery operation on a large scale was made possible by the formation of a national organization to pool the non-taxed profits retained in the capital structures of several major cooperatives to purchase the Globe oil refinery at McPherson, Kansas. Purchase of the Globe refinery was particularly significant to the petroleum industry since it represented the first national federation of cooperatives to enter the petroleum production and refining fields. National Cooperative Refinery Association was created by Central Cooperative Wholesale, Superior, Wis.; Midland Cooperative Wholesale, Minneapolis, Minn.; Farmers Union Central Exchange, St. Paul, Minn.; Farmers Union State Exchange, Omaha, Neb., and CCA, Kansas City, Mo.

The association was incorporated with an authorized capital of $2,010,000, or approximately 40 percent of the cost of the facilities acquired and it is assumed that government banks for cooperatives provided credit for the other 60 percent.

The "petroleum super-cooperative" was preceded by large regional cooperative wholesales, initially organized to supply petroleum and other products to the local petroleum associations. At first these were little more than brokerage agencies, but they were successful and soon extended their operations back to the sources of supply, i.e., crude production and refinery operations.

Organization of cooperative wholesale associations followed closely the growth of retail associations. The first association, incorporated in Minnesota in 1926, was the first co-op wholesale association in the U. S. to engage primarily in the distribution of petroleum products.

Importance of the wholescale associations is reflected in the dollar volume of sales figures compiled by the Farm Credit Administration for 17 major wholesale cooperatives during 1942. Total sales amounted to $287,960,907, and of this amount petroleum products represented an aggregate of $47,966,314.

The Banks for the Cooperatives, supervised by the Farm Credit Administration of the U. S. Department of Agriculture, extend credit at 3½ percent on loan to acquire facilities. These loans, by law, may be made in an amount up to 60 percent of the appraised value of the facilities to be acquired. Consequently, cooperatives in some instances have been able to finance the entire cost of their purchases by virtue of purchasing at a price decidedly lower than appraised valuations.

In 1934, cooperatives recognized the lucrative field in oil production and refining when Midland Cooperative Wholesale, Minneapolis; Indiana Farm Bureau Cooperative Association, Indianapolis, and CCA operated their own oil compounding plants and laboratories. At the close of 1943, nine cooperative wholesales owned 10 refineries with an estimated daily capacity of more than 46,000 barrels, hundreds of miles of pipe lines, 7 oil compounding plants, 1 grease plant and hundreds of oil wells.

In 1938, Pacific Supply Cooperative ventured into the field of refining by purchasing a part interest in Husky Refining Company of Cody, Wyo. To the original investment of $50,000 funds were added from time to time. In 1943 it disposed of these holdings which had grown to a third interest, at a sale price of $450,000.

Recognition of the potency of tax freedom as a competitive advantage was expressed as the reason for disposition by the board of directors when they stated:

"The corporate income tax structure had reached the point where it was confiscating most of the earnings of the company."

After the sale the company became a member of National Cooperative Refinery Association and invested its capital and profits in a part interest in the former Globe refinery.

In general, the petroleum cooperatives may be classed into two groups on the basis of their purchasing arrangement. The group handling the largest volume of products is that affiliated with cooperative wholesale organizations. The other group relies on the major and independent oil companies for their supplies.

The most recent available report from the U. S. Department of Labor shows 2327 local cooperative associations in the U. S. engaged in the distribution of petroleum products.

There were no associations listed for Florida, Nevada and Rhode Island. Although most of the associations handled all the major petroleum products, some engaged in the distribution of only one or two items. Gasoline was distributed by 2026 co-ops. Motor oil was retailed by 2248 associations, and grease by 2092.

By states:

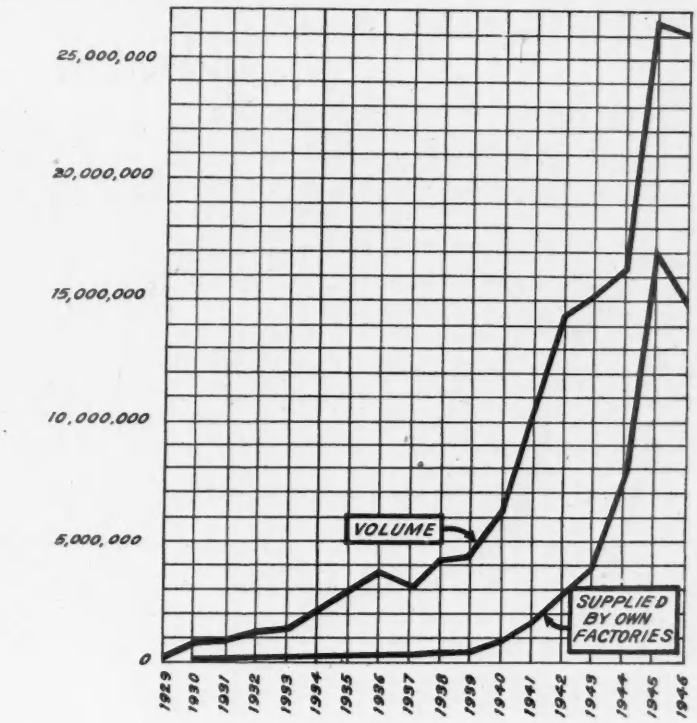
Alabama, 3; Arizona, 7; Arkasas, 13; California, 25; Colorado, 38; Connecticut, 14; Delaware, 1; Florida, 0; Georgia, 2; Idaho, 36; Illinois, 100; Indiana, 92; Iowa, 131; Kansas, 195; Kentucky, 2; Louisiana, 1; Maine, 7; Maryland, 8; Massachusetts, 27; Michigan, 99; Minnesota, 249; Mississippi, 2; Missouri, 83; Montana, 95; Nebraska, 184; Nevada, 0; New Hampshire, 3.

New Jersey, 23; New Mexico, 5; New York, 42; North Carolina, 7; North Dakota, 122; Ohio, 109; Oklahoma, 40; Oregon, 39; Pennsylvania, 54; Rhode Island, 0; South Carolina, 3; South Dakota, 76; Tennessee, 1; Texas, 66; Utah, 7; Vermont, 6; Virginia, 7; Washington, 76; West Virginia, 5; Wisconsin, 207; Wyoming, 13.

Alaska, 1; District of Columbia, 1.

Petroleum cooperatives intend to continue their expansion in crude production and refinery operation until they have sufficient capacity to service the demands of their consumer market. Cooperative wholesales are seeking, through the purchase of additional refining facilities, to meet the refined fuel needs of their members 100 percent. Co-op leaders declare: "Our consumer market ultimately will embrace the entire world market for petroleum products."

The four-step program to cooperative dominance of the petroleum world as well as international business is based upon (1) establishment of local markets through the formation of local cooperative associations; (2) formation of regional wholesale associations to capture the economies of large-scale purchasing; (3) organization of national "super-cooperatives" to produce and manufacture; and (4) the creation of international cooperative cartels to dominate world markets and to obtain control of all sources of supply.



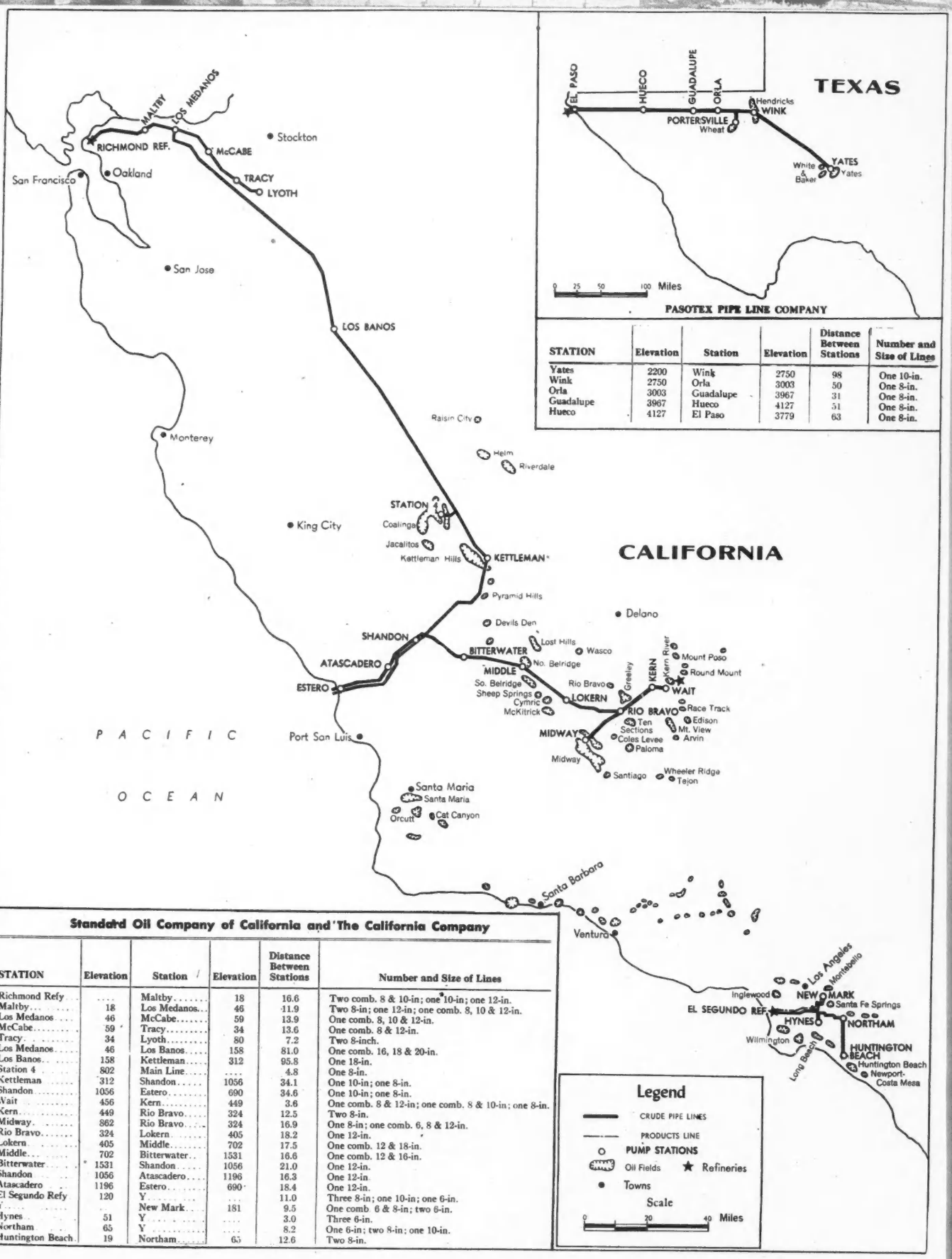
Figures shown on the chart indicate volume of business done in dollars.

Pipe Lines of the U. S.

Standard Oil Company of California

And Subsidiaries

13th of a Series



PASOTEX PIPE LINE COMPANY

STATION	Elevation	Station	Elevation	Distance Between Stations	Number and Size of Lines
Yates	2200	Wink	2750	98	One 10-in.
Wink	2750	Orla	3003	50	One 8-in.
Orla	3003	Guadalupe	3967	31	One 8-in.
Guadalupe	3967	Hueco	4127	51	One 8-in.
Hueco	4127	El Paso	3779	63	One 8-in.

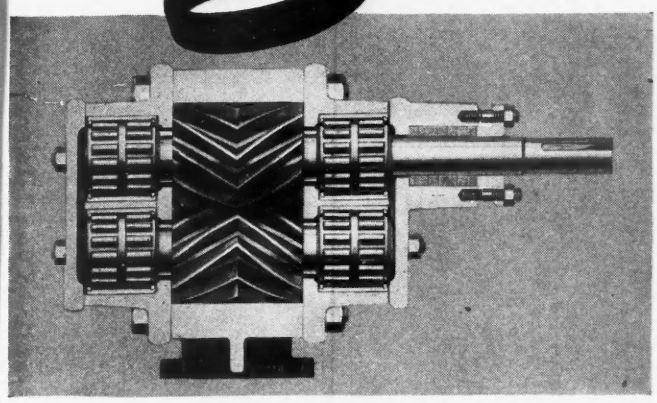
Standard Oil Company of California and The California Company

STATION	Elevation	Station	Elevation	Distance Between Stations	Number and Size of Lines
Richmond Refy	....	Maltby	18	16.6	Two comb. 8 & 10-in; one 10-in; one 12-in.
Maltby	18	Los Medanos	46	11.9	Two 8-in; one 12-in; one comb. 8, 10 & 12-in.
Los Medanos	46	McCabe	59	13.9	One comb. 8, 10 & 12-in.
McCabe	59	Tracy	34	13.6	One comb. 8 & 12-in.
Tracy	34	Lyoth	80	7.2	Two 8-inch.
Los Medanos	46	Los Banos	158	81.0	One comb. 16, 18 & 20-in.
Los Banos	158	Kettleman	312	95.8	One 18-in.
Station 4	802	Main Line	....	4.8	One 8-in.
Kettleman	312	Shandon	1056	34.1	One 10-in; one 8-in.
Shandon	1056	Estero	690	34.6	One 10-in; one 8-in.
Wait	456	Kern	449	3.6	One comb. 8 & 12-in; one comb. 8 & 10-in; one 8-in.
Kern	449	Rio Bravo	324	12.5	Two 8-in.
Midway	862	Rio Bravo	324	16.9	One 8-in; one comb. 6, 8 & 12-in.
Rio Bravo	324	Lokern	405	18.2	One 12-in.
Lokern	405	Middle	702	17.5	One comb. 12 & 18-in.
Middle	702	Bitterwater	1531	16.6	One comb. 12 & 16-in.
Bitterwater	1531	Shandon	1056	21.0	One 12-in.
Shandon	1056	Atascadero	1196	16.3	One 12-in.
Atascadero	1196	Estero	690	18.4	One 12-in.
El Segundo Refy	120	Y	....	11.0	Three 8-in; one 10-in; one 6-in.
Y	....	New Mark	181	9.5	One comb. 6 & 8-in; two 6-in.
Hynes	51	Y	....	3.0	Three 6-in.
Northam	65	Y	....	8.2	One 6-in; two 8-in; one 10-in.
Huntington Beach	19	Northam	65	12.6	Two 8-in.

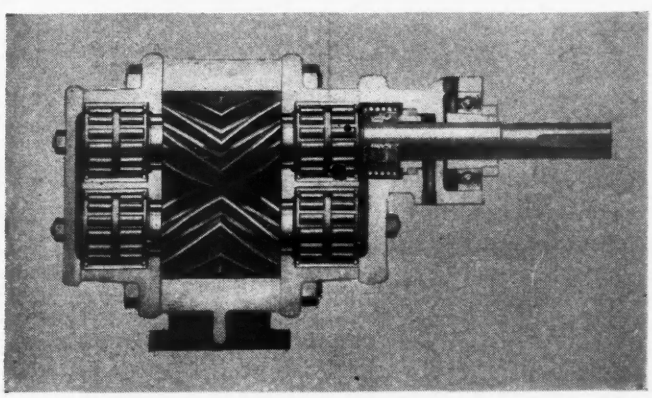
3 PUMPS YOU CAN INSTALL

...and forget

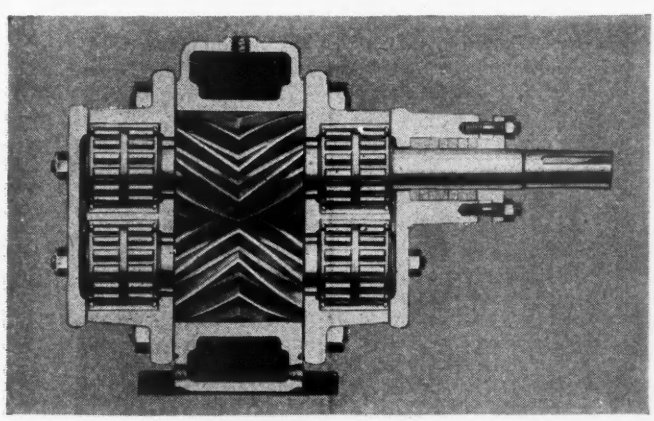
... Worthington Rotary Pumps Have Built-In "Performance Insurance"



Longitudinal section through standard GR type rotary pump.



Longitudinal section through GRMI type rotary pump provided with mechanical bellows-type seal and inboard bearing for overhung drive.



Longitudinal section through GRJ type rotary pump incorporating steam jacket for pumping asphalt ... tar ... grease ... petroleum jelly etc. Special water jacketed stuffing box is provided for operating temperatures exceeding 350° F.

Yes, you can place these Worthington GR rotary pumps on the job in the oil fields . . . on the line . . . in the refinery . . . and promptly forget them. Except for normal periodic servicing, they perform efficiently year after year without attention or repair. Here are five reasons why:

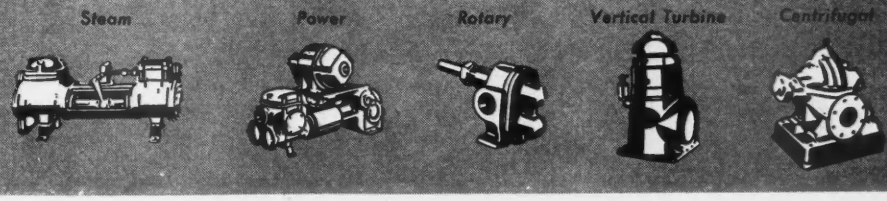
- Single stuffing box or seal is subject to suction pressure only, thus minimizing leakage.
- Precision machining and close clearances reduce slippage . . . provide high suction lift.
- Free-flow pump passages boost efficiency.
- Double-helical gear rotors eliminate axial thrust . . . prevent trapping.
- Simple construction permits maximum accessibility for inspection. Pipe connections need not be broken.

In plants all over the world . . . pumping gasoline, crude, bright stock and grease . . . GR rotary pumps are proving that *there's more worth in Worthington.* Send for bulletins W-487-B10B and W-487-B11 for details. *Worthington Pump and Machinery Corporation, Reciprocating Pump Division, Harrison, N. J.*

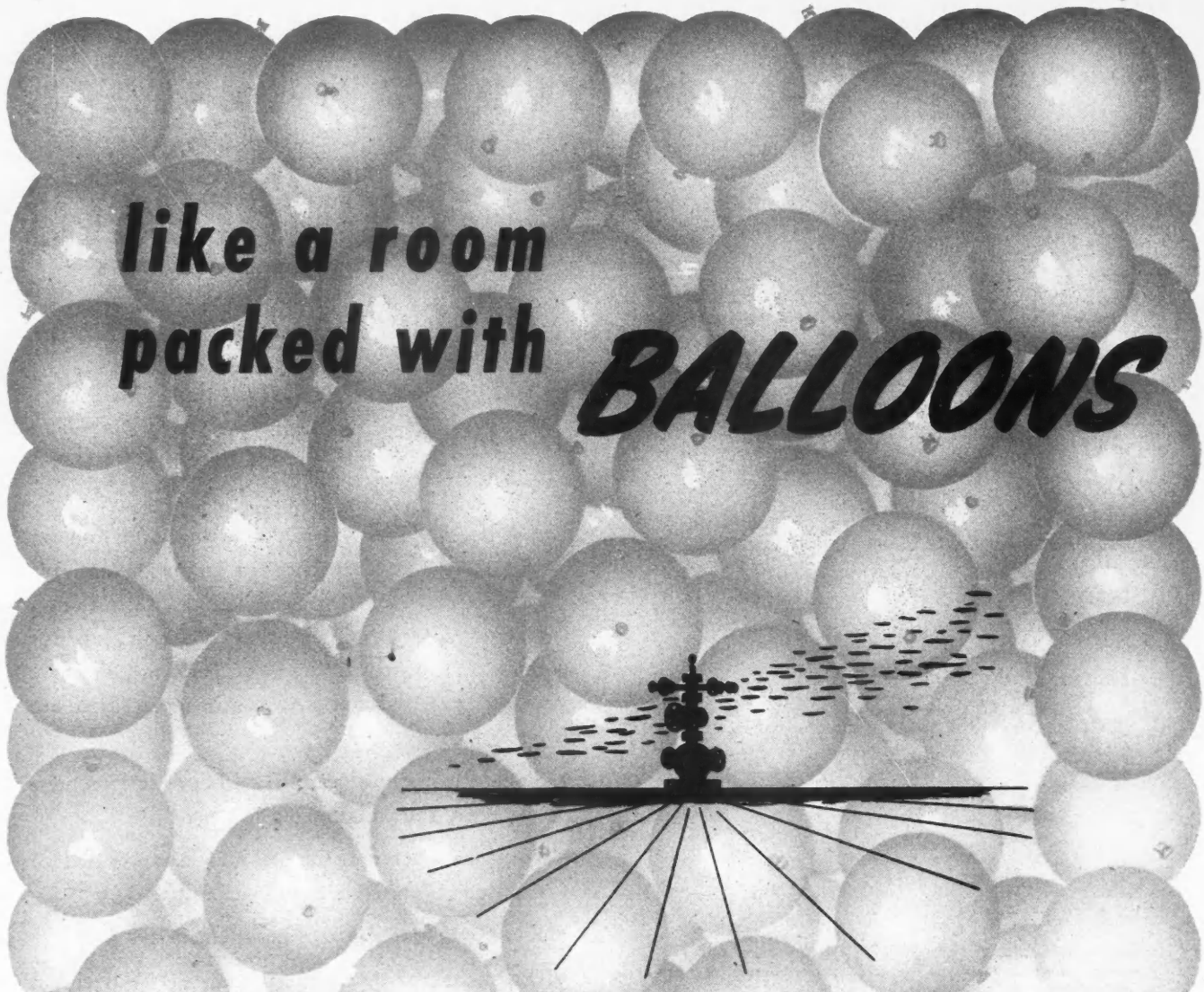
WORTHINGTON

P7-7

THE WORLD'S LARGEST MANUFACTURER OF PUMPS



like a room packed with BALLOONS



In order for an operator to fully comprehend what is happening to the fluids within a producing reservoir as the oil is being withdrawn, he must have some concrete knowledge of the change in volume of the remaining oil in relation to a unit change in pressure.

This is done by obtaining a sample of the reservoir fluid and measuring, in the laboratory, its particular change in volume with reference to possible pressure variations. The result is commonly called Pressure-Volume Relation and is measured at reservoir temperature. These data are presented in terms of the volume which one barrel of oil, with its dissolved gas, under original reservoir conditions, will occupy at any subsequent pressure.

It is like a room tightly packed with inflated balloons. Remove one balloon and the remainder will expand and immediately reoccupy the empty space. In doing this, all of the balloons are able to occupy more space than previously. Thus, the Pressure-Volume Relation of a reservoir may be compared to the ever-changing size of one of these balloons as the room is slowly emptied.

With an accurate knowledge of the relation of pressure versus the volume of a given crude, plus the evaluations of other physical properties, an operator can intelligently predict the pressure history of a reservoir.

The measurement of Pressure-Volume Relation is another step in Core Lab's development of a comprehensive Reservoir Fluid Analysis, so important to maximum recovery by natural, primary, and secondary recovery methods of production through Controlled Reservoir Performance.

Core Lab continues to maintain its position as first in the advancement of Petroleum Reservoir Engineering.

CORE LABORATORIES, INC. ● DALLAS 11, TEXAS

CORE LAB

PETROLEUM RESERVOIR ENGINEERING

Patent Roundup

A Regular Feature of THE OIL WEEKLY

In this column are reviewed patents dealing with drilling, producing and pipe line branches of the oil industry that are issued by the United States Patent Office

Patents issued by the United States Patent Office, Washington, D. C., include those listed below.

Printed copies of the patents listed are furnished by the Patent Office for 25 cents per copy and can be had by addressing the Commissioner of Patents, Washington 25, D. C.

Split Packing Ring Coupling

Stephen V. Dillon, Tulsa, has assigned this patent (No. 2,417,741) to Hanlon-Waters, Division of General Finance Corporation. It is a ring-shaped one-piece elastic gasket designed to enfold piping.

The ring is split across, and a sectional annular housing surrounds the gasket, with sections arranged end to end and adapted to engage the end portions of the gasket and force them towards one another. That part of the gasket between its end portions is free to slide relatively to the housing, and the end portions of the gasket are provided with shoulders forming abutments for the housing.

Pump Rod and Pipe Clamp

This patent, No. 2,417,533, granted to Wylie S. Wilkinson, Bayard, N. M., is unassigned.

The pump rod clamp has a relatively heavy body with marginal edge flanges top and bottom, and is formed with hingedly connected sections held together by a dog in opposite positions so that internally threaded enlargements are aligned, a slot in one section in alignment with one of the enlargements. A pair of jaws is carried by the body, one being removably attached to form a fixed jaw. The other can be slid on the body with reference to the first jaw. A screw for moving the sliding jaw is mounted in the slot and aligned enlargement; a handle for the body is mounted in the opposite aligned enlargement.

Valve

Patent for this valve construction (No. 2,417,901) has been granted to Aaron B. Bagsar, Drexel Hill, Pa., and assigned by him to Sun Oil Company.

The body is composed of a casing having a tubular bore in communication with a housing, extending from the casing and communicating with the tubular bore, which is divided by a partition into fluid inlet and fluid outlet sections. An aperature in the partition forms a valve seat and communicates between the sections. The valve plug member cooperates with the valve seat and includes a hollow extension positioned within the housing and provided with an internal screw-threaded area, a cooperating screw-threaded shaft. By reciprocating means the valve plug member may be screwed into the housing and is permitted a rotative movement of the valve plug member through a predetermined arc prior to its reciprocative movement. Flange means extending laterally from the valve plug member are movable so as to slidably engage the housing wall and maintain the valve plug member during its reciprocative movement in true alignment with the valve seat.

Pipe Cleaning Apparatus

This rod guide and scraper device for use on a string of sucker rods has been patented (No. 2,402,345) by James P. Ratigan, Los Angeles. It is unassigned.

Coupled to the ends of a pair of adjacent sucker rod sections is an elongated shank on which is placed a number of scraper blades, each comprising a segment of a tubular cylinder disposed about the shank in such positions as to form a substantially continuous annular cylindrical blade whose diameter is substantially equal to the internal diameter of the tubing. A means for supporting the blades in spaced relation to the shank comprises a relatively narrow member. Blades are yieldable radially relatively to the shank.

Rotary Drilling Unit

This unit is patented (No. 2,408,364) by Daniel A. Bennett and August R. Maier, Oil City, Pa., and assigned to Oil Well Supply Company.

The unit combines a prime mover for a rotary with connecting shaft between and an auxiliary drive for the transmission of power to and from the unit, consisting of a pair of spaced couplings disposed in the connecting shaft and adapted to interrupt separately the transmission of power from the prime mover to the rotary. There is a transmission member which can rotate freely on the portion of connecting shafting between the couplings, and a means for selectively connecting the transmission member to that portion of the shafting.

Well Explosive Device

This patent (No. 2,408,419), issued to James Lewis Foster, Wichita Falls, Texas, is unassigned.

In a well hole, opposite an oil bearing strata and protected by casing to a point spaced above the lower end of the hole, an explosive device is suspended which carries an explosive projectile and a means for discharging the projectile into the surrounding strata at a point below the casing to increase the exposed area of the formation.

Water Locating System

This method has been patented (No. 2,410,278) by Riley Floyd Farris and Joseph B. Clark, Tulsa, and assigned to Stanolind Oil & Gas Company, Tulsa.

For locating the zone of ingress of salt water, in a well producing both oil and water, first, the well is conditioned to remove the water inflow, and liquids are then permitted to enter the well. A portion of the fluids are trapped for an appreciable period of time within at least one constricted zone, the watery fluids accumulating at the lower portion of the zone and producing a change in a signal when the amount of such accumulated fluid exceeds a predetermined minimum quantity.

Stuffing Box

Robert B. Kinzbach, Houston, has been issued patent (No. 2,410,291). It is unassigned.

A housing has a rod passageway and an internal chamber in which is a rod sealing assembly, including an internal rigid cage having upper and lower rod bearings and also having an internal chamber. A sealing means fills both chambers and forms a seal around the rod through the stuffing box, the ends of the cage sealing the rod passageway, around the rod, at the top and bottom of the housing chamber. The assembly is internally movable, with the rod in the housing.

Overshot

Patent No. 2,410,262 has been issued to Neil T. Breaux, Houston, and is unassigned.

The overshot comprises a tubular body adapted to telescope over a pipe in a well, with an actuator yieldably mounted in the body but keyed against rotation. There is a tubular carrier in the body, a yieldable seat above the carrier in the body against which the carrier is seated, dogs pivoted to and depending from the carrier. The dogs and actuator have cooperating parts effective to move the dogs inwardly into engagement underneath an external projection on the pipe when there is a downward movement of the carrier relative to the actuator.

Automatic Slip

This patent (No. 2,410,589) is held by August L. Segelhorst, Taft, Calif., and is unassigned.

In a well pipe supporting means is a housing, in which is seated a segmental slip bowl, and on which is mounted a yieldable means that releasably secures the bowl to the housing. The yieldable means is adapted to be overcome by a predetermined upward force on the bowl and slips downwardly slidably receivable in the bowl engage and support against downward movement a pipe extending through the bowl.

Pipe Cleaning Oven

This patent (No. 2,416,412), a pipe cleaning oven, was issued to Forrest A. Smith, Fort Worth.

A carriage adapted to move along pipe to be cleaned supports an oven which is shaped to surround the pipe and form an inclosed chamber about the pipe. Hoods on the oven provided with perforations permit the extension of nozzle pipes into the chamber. There is a means for supplying a combustible mixture through the nozzle pipes into the chamber.

Outside Pipe Cutter

This outside pipe cutting tool, patented (No. 2,418,278) by Dempson H. Reed, Houston, is unassigned.

It consists of a housing and a means to anchor it against upward movement on the pipe being cut, including a means to contact the pipe, and a means for moving the anchor, by flow of liquid pressure in the tool, into firm biting engagement with the pipe.

DESIGNS FOR OIL FIELD TOOLS

TO AID IN Water Flooding

By FREDERICK SQUIRES
Petroleum Engineer, Illinois State Geological Survey

THIS is a description of proposed designs for three new oil field tools to solve problems presented by water flooding. They are the shot-hole caliper, the shot-hole core-drill, and the rotor valve. The first two tools supplement each other in the process of finding permeabilities of the sand in old wells in the absence of original core analyses. The last is for measuring and regulating the flow of water from an upper into a lower sand.

The suitability of old oil fields for water flooding may be determined in part by studying lease histories of their initial, cumulative, and present productions of oil and water, their sand thickness, structure, and past responses to vacuum or gas repressuring. Such information usually is available, but data on permeability, porosity, sand grain size, clay content and cementing material of the oil sand are rarely known. These characteristics may be determined best by examination of cores, but in many old fields and some new ones, no cores have been taken. The relative permeabilities of equal vertical sections of the sand may be found, without drilling, by measuring in the well the rate of water or gas intake, under uniform pressure, as the well bore through the sand is filled up, in equal vertical amounts, by a self-removable seal. But in order to know how much of the seal material it will take to fill up to each desired height, it is necessary to know the diameters of the shot hole, which can be determined only with a caliper.

The same is true if the relative permeabilities from bottom to top are determined by means of injecting two liquids of different densities and conductivities, the interface between which is located by an electric pilot, and which interface is lowered by pumping in more of the lighter liquid under uniform pressure throughout the thickness of the sand while timing the descent of the interface. (A simple float may take the place of the electric pilot[1].) Here again it is necessary to know the diameter of all cylinders of equal length exposed to the water in order to correct the intakes of such units to the intake of a standard sized area of exposed surface.

The distance between any two cores taken by the shot-hole core drill, when the bottom of the drill is raised by equal unit distances, depends on the radii of the shot hole at the points where the cores are taken. This also requires a caliper picture of the shot hole.

The third tool is necessitated by the relatively new practice of flooding lower oil sands with water supplied directly from the upper water sands in individual wells. The present method is to gun-perforate the casing opposite the water sand with the number and size of shots estimated to be sufficient to admit just the proper volume of water. But in the absence of accurate information as to the permeability of the oil sand and the degree of pressure in the water sand, there is no basis for determining the best number and size of casing perforations. In many cases at Allendale and in the McClosky (Illinois) areas the amount of water admitted is too great and its travel from water well to oil well is too fast. The measuring and regulating rotor-operated valve is intended to overcome this difficulty.

Shot-Hole Caliper

The shot-hole caliper is shown by a sketch of the method of using the caliper in a shot hole and a section of the caliper itself, drawn to scale, in Figure 1.

The caliper has a long Body, cross-formed in section, made up of four cornering angles, one face of each angle of which has been painted or covered by a thing sheet of aluminum. At the upper end of each of the four angles, an arm is attached to a slide and held against the center member by a hook at the bottom but under outward pressure from a spring while the tool is being lowered through the well on a wire line from a pulling machine. When the caliper hits the bottom of the shot hole the momentum of the slides unhooks and releases the arms, and the springs force their free ends against the walls of the shot hole.

On each arm, contracting the stationary body of the caliper, is a sharp-pointed marker, held forcibly against the aluminum or painted side of the angle, on which the upward motion of the marker leaves a scratch which bears a one-tenth relation to the profile of the shot hole.

While hooked to the bottom of the caliper the arms carry the whole weight of the tool by means of rods from the top of each arm, running the length of the tool and attached, above the tool, to the pulling-machine wire line. When the arms are released by contact with the bottom of the shot hole, the main body of the caliper is temporarily left resting on bottom. Then the arms, having spread to the sides of the shot hole, are raised by reeling up the pulling machine wire line. In their travel, the upward moving pins on the arms mark the sides of the stationary angles. The radius of the mark on the angle is one-tenth of the corresponding radius of the shot hole. When the top of the slides to which the arms are attached reaches the top of the cross-formed main body of the caliper, the tops of the slides are stopped against a solid circular cap which forms the upper end of the tool, and the pulling machine raises the whole assembly to the surface. The scratch marks on the painted or aluminum covered angles are then measured and the outline of the shot hole is drawn by increasing ten times the radii of the outline marked on the angles. If aluminum strips are used they may be detached, rolled up and sent to the office for enlarging by drafting into the accurate outlines of the shot hole.

The advantage of this mechanical caliper is in its simplicity. Any lease man can operate and read it after it has brought its evidence to the surface. The shot-hole caliper provides approximate data on the shape of the shot hole, information needed in the method of determining permeability by the introduction of liquids, and useful when selective shooting is to be done. The original shooting which made the shot hole was for a purpose opposite to that now required, because the first shot was placed in the section of greatest permeability whereas the new shots must be placed in the least previous parts of the sand. The first shot was intended to increase oil production, the later shots to increase water intake of denser sections.

In the writer's opinion the present-day oil well caliper does not check exactly with the spot in the hole at which it

Figure 1. This tool marks outlines proportional to the profiles of the shot hole by means of movable arms traversing a stationary body. It is intended to be run with a standard pulling machine and the results are easily understood by the oil field worker. Shot hole profiles are needed to give information necessary in obtaining permeability profiles in old wells. It is proposed to build this tool and operate it in the field after which the results obtained and refinements made will be described in a later article.

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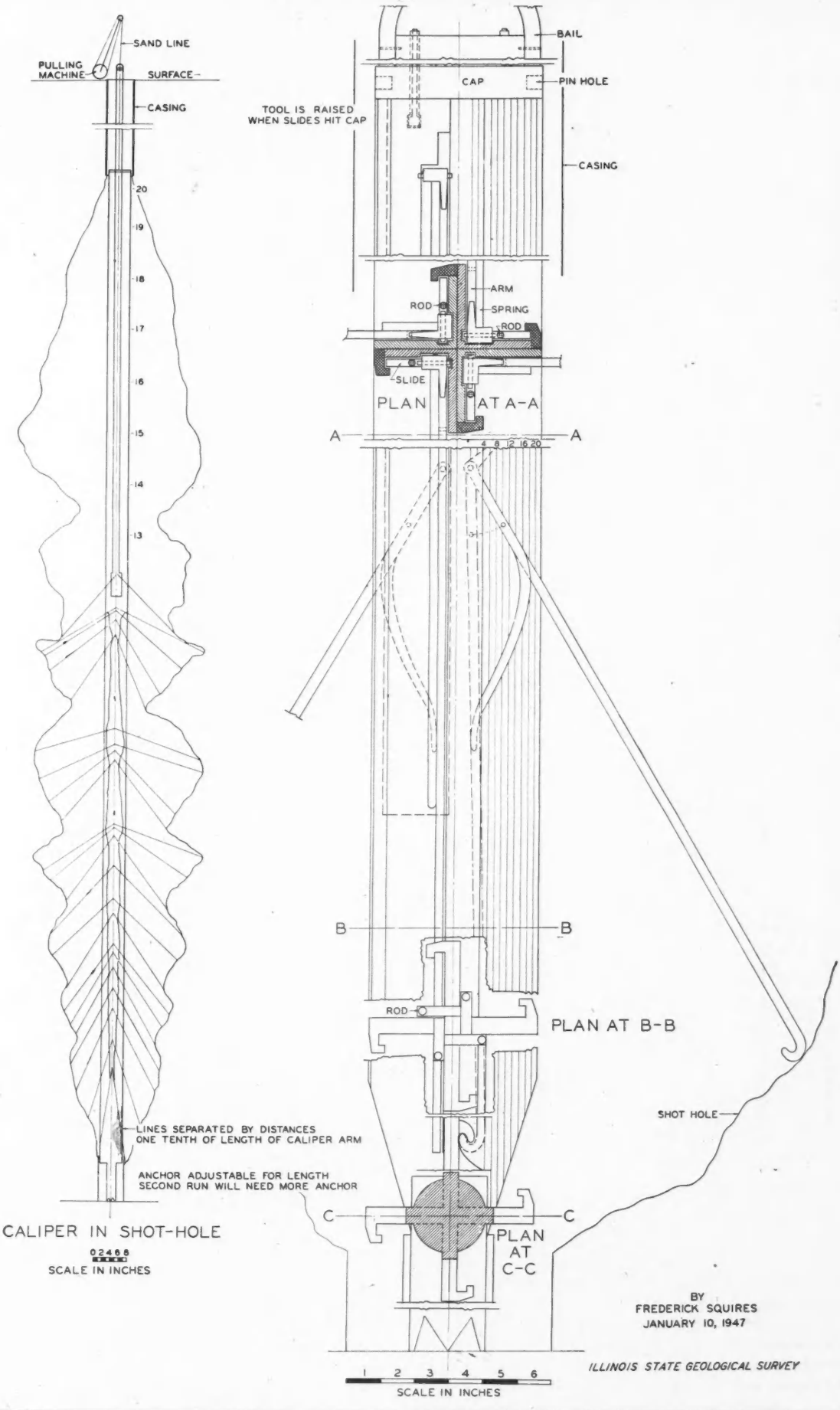
SHOT-HOLE CALIPER



BY
FREDERICK SQUIRES
JANUARY 10, 1947

ILLINOIS STATE GEOLOGICAL SURVEY

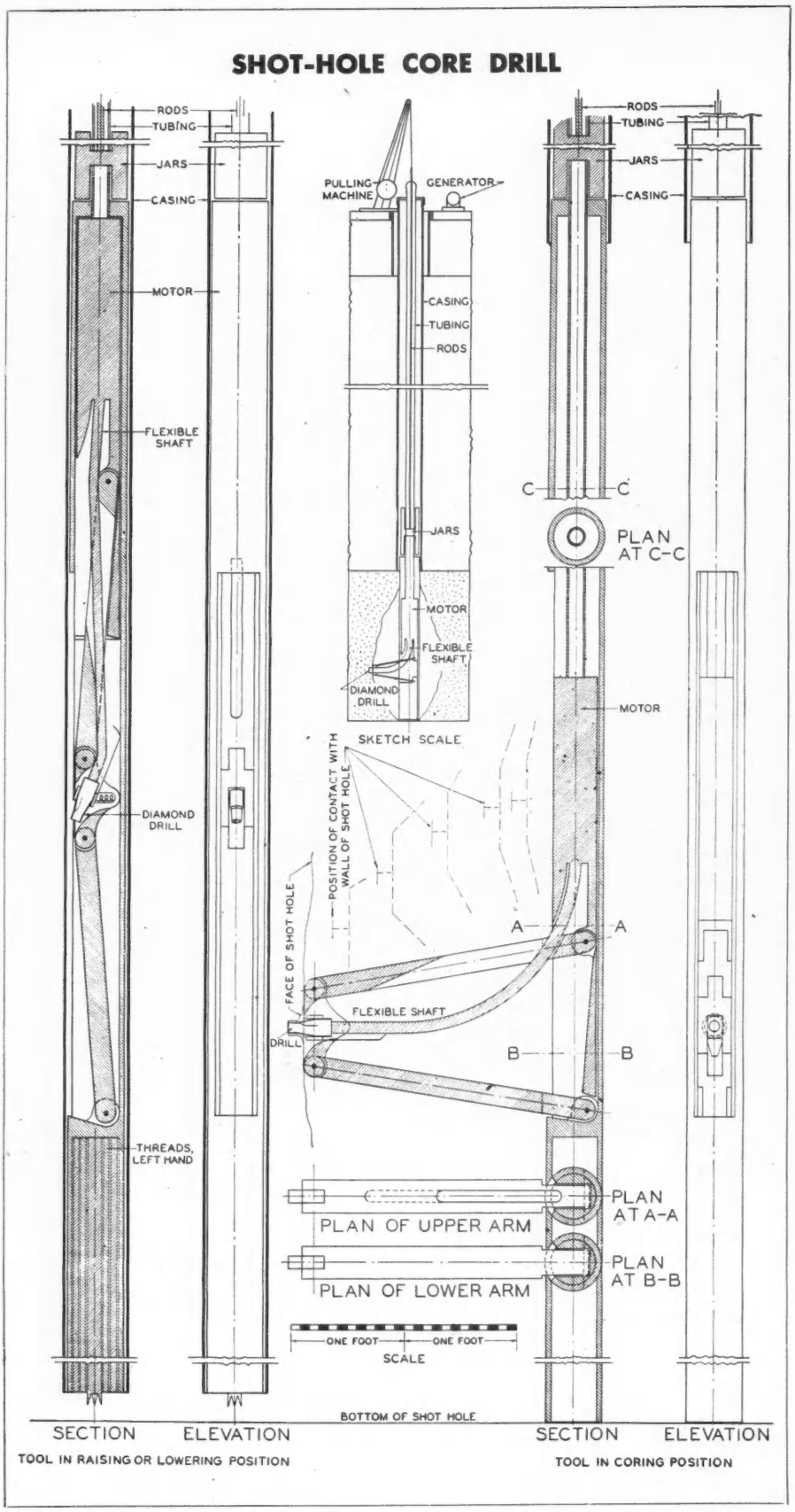


Figure 2. This tool is to obtain cores from the sides of shot holes in old wells. It employs the devices of telescoping cylinders which project the drill to the side of the shot hole, and the use of a high-speed diamond drill operated by an electric or air-driven or turbine motor to rotate the diamond drill. It is designed to cut a number of cores without withdrawing from the well. The tool can be run on a standard pulling machine and operated by oil field workers. Pressure on the drill may be regulated by hanging the tubing on a temper-screw or by a spring behind the drill itself attached to the contact member, in which case the temper screw would not be needed. This tool will be built and operated and the results described.

was taken and it cannot measure undercutting. These imperfections are due to the fact that the arms always point downward. An accurate picture never can be made until someone invents a caliper with arms which can be projected horizontally outward.

Shot-Hole Core Drill

With the shot-hole core drill, cores may be taken in old shot holes to supplement permeability tests made by fluid injections or as an alternative to them.

The tool is shown in the sketch in Figure 2. It is a long tube which looks, on the outside, like a bailer, and the assembly is lowered into the well on tubing with a standard pulling machine.

Inside, slidable within the outer shell, is a second cylinder to which the well tubing is attached. The outer and inner tubes are connected by arms which lie in nearly vertical line while the tool is being lowered into the well but which are forced outward by the telescoping action of the tubes when the outer tube stops on bottom, and the weight of the tubing forces the inner tube into it, in much the same way that one opens an umbrella. The weight of the tubing, which has moved the inner tube downward into the stationary outer tube, forces the ends of the arms outward until they contact the wall of the shot hole. The inner tube contains an electric motor connected to a generator at the surface. The motor actuates, by means of a flexible shaft, a diamond drill mounted at the junction of the outer ends of the arms. The arms force and hold the outer ring of the diamond drill against the shot hole wall while the rotation of the diamond drill cuts out a core. The drill can penetrate only a predetermined distance, being stopped by a guard at the end of the arms. Just before complete penetration is reached the core contacts a sloping member inside and at the back of the drill which breaks the core loose from the shot-hole wall. Two springs on the inner surface of the drill tube hold the core until the succeeding core drives it farther back in the body of the drill.

The tool is then raised enough to retract the arms, the tubing is turned, left to right, which causes the left-hand threaded members in the bottom of the outer casing to screw out in the manner of a compound jack, raising the drill to a point at which a second core may be taken. As the tool is now designed this process can be repeated four times before the core drill has to be raised out of the hole for lengthening. An anchor is then inserted and the operation repeated until the shot hole is cored at predetermined equal intervals from bottome to top. Drills of later design will recover more than four cores without re-anchoring.

These cores are suitable for determinations of permeability, porosity, grain sizes, clay content, and cementing material. For these reasons they are a valuable aid in determining which old fields are suitable for water-flooding.

Rotor Measuring and Regulating Valve

Years ago the conditions at Allendale were studied where water from an upper formation was flooding the Biehl oil sand through holes in the casing and producing startling increases in oil. The amount of water entering the oil sand

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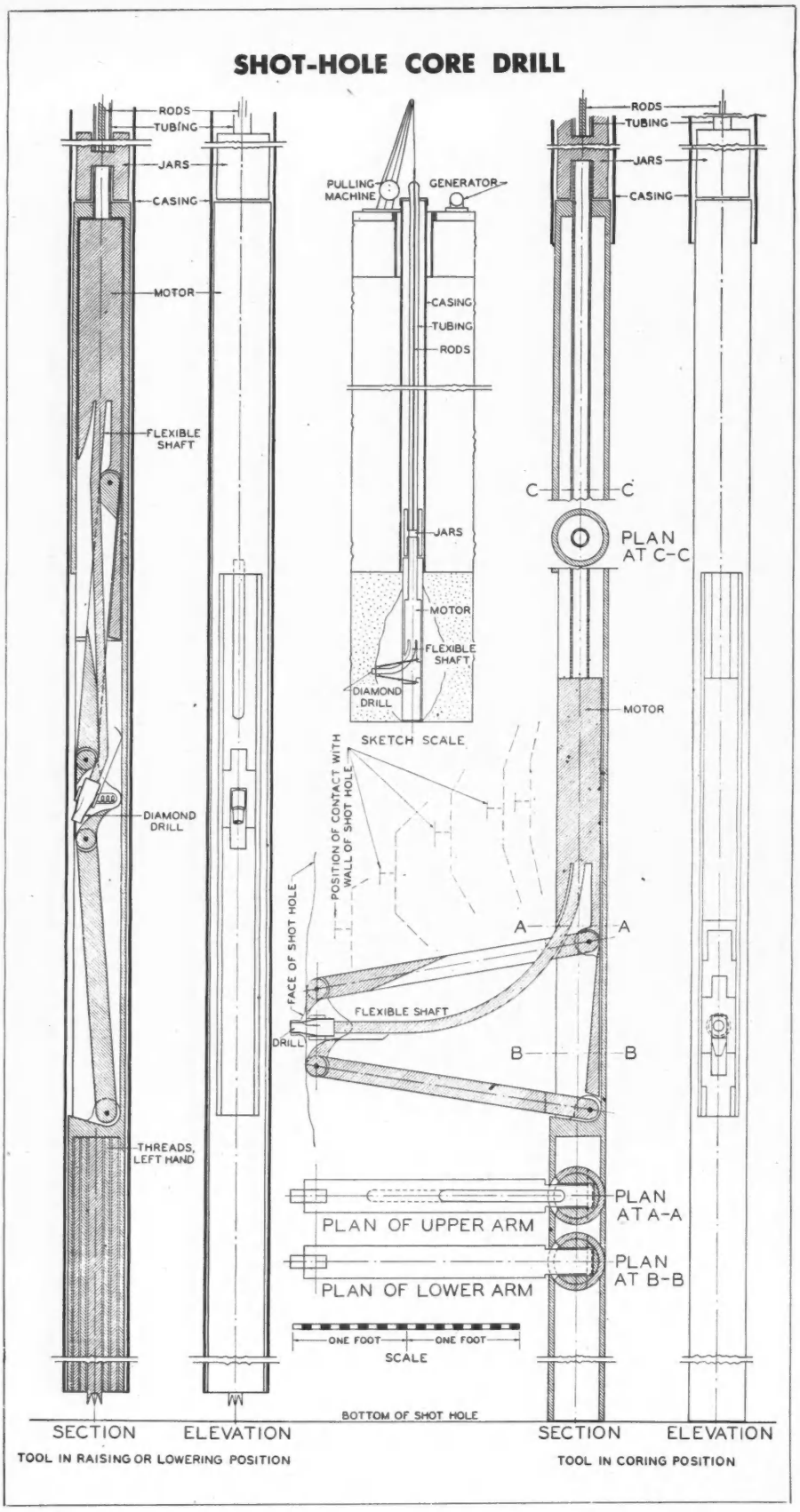

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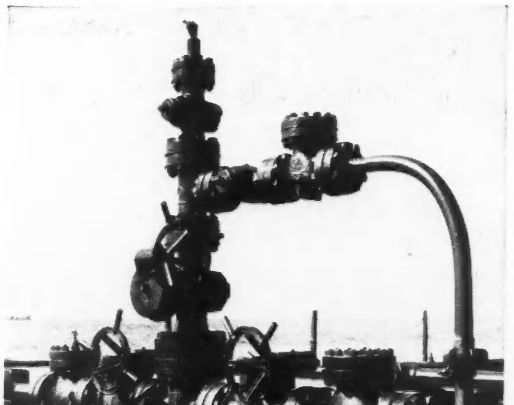

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was unknown and could not be controlled, and it was obvious that, in some instances, the volume was far too great so that wells were flooded out before they had time to make their production. The need of some means to measure and control the rate of water input became obvious.

At present the same kind of thing is happening in some of the McClosky fields, although the upper water has been let in purposely by gun-perforating the casing. As at Allendale, the volume of water is unknown.

Flooding in these fields has been profitable and justifies an effort to improve the technique. The design of the rotor valve assembly, shown in Figure 3, is such an effort.

Description of Process

In general the process consists of perforating the casing in an oil well opposite an upper water sand and running tubing on a packer. At some point in the tubing string, preferably above the water sand, the stationary part of the valve is placed. After tubing is completed the inner part of the rotor valve assembly is run into the tubing on rods and landed on a seat provided in the stationary body.

The valve is regulated by a ball governor actuated by a rotor, the number of revolutions of which is recorded at the surface by means of a make-and-break device in a two-wire circuit. Instead of governor-operated valves, stationary valves may be used, the proper water intake resulting by changing the size of the orifice.

With the automatic valve open, water flows through the rotor, the turning of which operates the ball governor. This in turn operates the opening in the slide valve by raising or lowering it proportionally to the speed of the rotor, causing it to cut off more or less of the water inlet through the tubing. By a proper choice of valve orifice, an equilibrium will be set up, in which the governor keeps the valve open just enough to admit the desired amount of water.

The valve may be let in and pulled out through the tubing by a pulling machine in the way an inserted working barrel is handled.

Summary

These three tools are offered in the hope of solving problems in water-flooding. It is intended to build and try them out under field conditions. No one of them will be expensive, and each can be operated by oil field workers. They will supplement the information now available through electric logging and production histories. The caliper and core drill, by providing cores for permeability tests, will aid in selecting areas suitable for water-flooding in territory, which, because of past successes, is now being investigated for secondary recovery possibilities.

Acknowledgments

The writer wishes to take this opportunity to thank A. H. Bell, Paul G. Luchhardt, J. E. Lamar, J. S. Machin, P. W. Henline, C. A. Bays, M. W. Pullen, R. E. Grim and Walter Squires for help on this paper.

BIBLIOGRAPHY

[1] Leo Coulter's Patent No. 2,413,435.

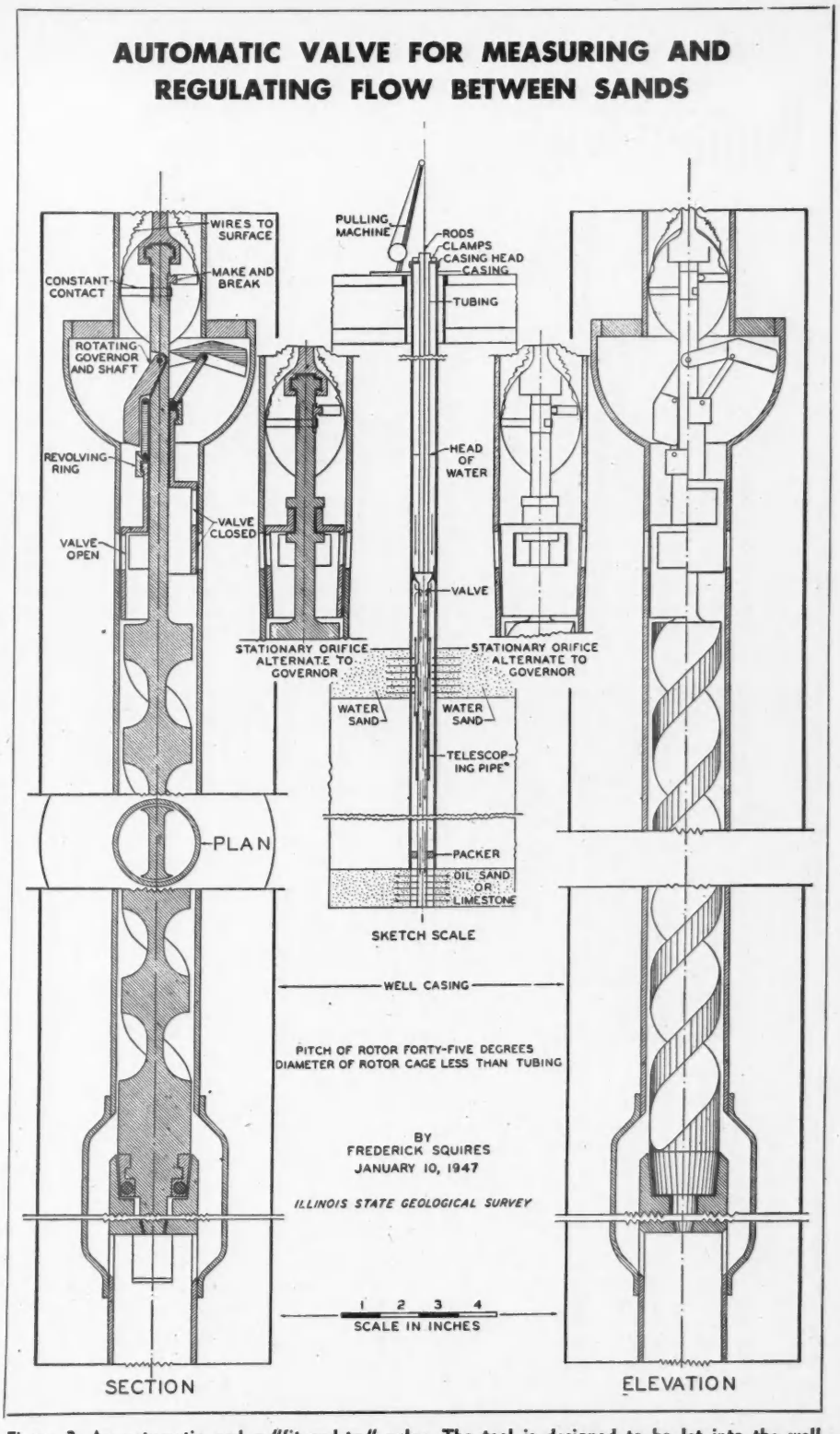

Figure 3. An automatic and a "fit-and-try" valve. The tool is designed to be let into the well and withdrawn as would be done with an inserted working barrel. The position of the outer body may be changed to vary the water head by means of telescoping joints of pipe below the valve. The speed of the rotor may be indicated by electric make-and-break circuit, or by the sound of the make-and-break mechanism conducted by a column of water filling the tubing from the valve to the surface and read at the surface by a water-proof contact microphone fed into an audio-amplifier connected to a head phone.

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Unitized Roofing and Siding

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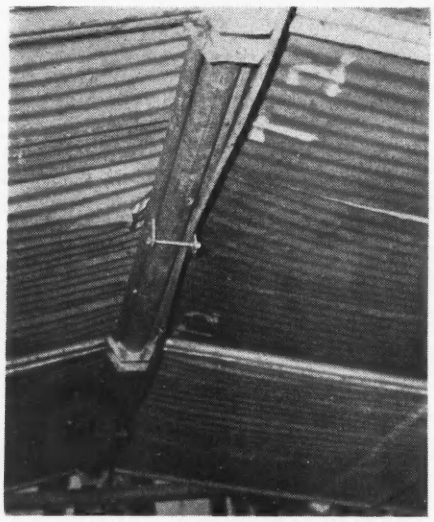
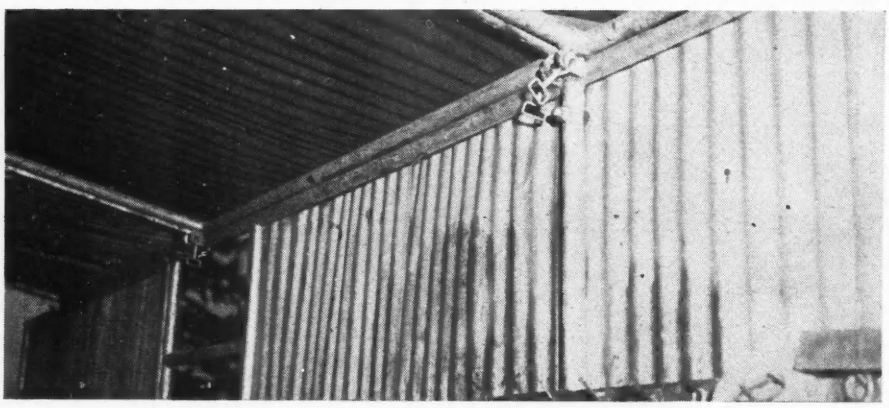


Figure 1 (Above). Roof panels abut against a three-inch ridge pole, the individual sections being supported by small cradles welded to the pipe. Intermediate points are tied together with bolts underneath the pole.

Figure 2 (Below). Siding and roofing panels are joined at the eaves with ordinary harness snaps hooked through matching ears welded to the several sections. These quick-acting snaps are amply strong for this service and require no tools for attaching. Side sections are supported in pipe sockets at floor level.



SIMPLIFICATION and unitization of drilling equipment enclosures contribute much toward cutting down rigging time, and the standardization of fittings required generally tends to inspire short cuts and time-saving features in associated pieces of equipment. In wildcat drilling, this practice is especially worth while, and it is on one such wildcat rig that the unitization described below was employed. Made of corrugated iron, the enclosure shown was made into sections and assembled with only a few bolts, some of the joints being held together with harness snaps.

Roof sections were made up into 6½-foot wide panels, each consisting of three pieces of galvanized corrugated iron edged with and bolted at 12-inch intervals to 1¼-inch pipe. Along the ridge of the roof the sections are joined by abutting them against a three-inch pipe which runs the length of the roof. Ears welded to the under side of the centers of panel sections are bolted together beneath the three-inch ridge pole. At points where adjoining panels abut against the ridge these corners are supported on small yokes cut from steel plate, the two plates being welded to the 3-inch pipe. Each of the plates supports two corners of as many panels, as illustrated in Figure 1.

Side panels, while not broken up into sections as regular as the roofing, due to doorways, windows, etc., which interfere, nevertheless are as easily assembled and disassembled. The panels are constructed in a similar manner, with 1¼-inch pipe supplying rigidity to the sections. Vertical legs of the panelling extend some six inches below the floor level to fit into 1½-inch pipe sockets which are welded on horizontally mounted sub-floor supports.

Of unusual interest, however, is the method employed for joining the roof panels to the vertical wall sections. Matching ears welded to the several sections as shown in Figure 2 are brought together and held in place with large size harness snaps. These fasteners have a simple snap action which latches positively and is amply dependable for such service. They have as their chief advantage, the ease with which they can be installed and removed as compared to common bolts.

The entire structure may be assembled and disassembled in a very short time, and in addition, involves little extra cost in the construction of the sections. Unitization of the corrugated sheeting also materially aids in prolonging the life of that material since nailing and stripping off at each drilling job is eliminated.

Imports During February Register Slight Decline

The United States is depending on imports of crude oil to supplement domestic supplies, and in February brought in nearly four times as much as was exported, the Department of Commerce announced last week. Crude imports declined from 9,309,139 barrels in January to 8,408,163 barrels, and crude exports gained from 2,528,853 to 2,610,370 barrels.

February liquid product imports included 55,528 barrels gasoline against 55,400 barrels in January; 325,503 barrels gas oil and distillate fuel against 611,025; 4,651,279 barrels residual fuel against 5,914,216; 3558 barrels unfinished oil against 59,918 and 8465 barrels. other liquids against 7189. Other imports amounted to 19,055 long tons against 10,764 tons, almost entirely petroleum asphalt.

Exports included 201,219 barrels natural gasoline against 320,837 barrels in January; 381,531 barrels aviation fuels against 80,766; 4,224,632 barrels other motor fuels against 2,454,200; 930,416 barrels kerosine against 394,475; 1,751,-101 barrels gas oil and distillate fuel against 876,475; 712,682 barrels residual fuel against 733,416; 1,258,105 barrels lubricating oil against 1,103,737, and 21,-629 barrels other liquids against 30,742.

Total value of imports was $18,435,909 in February against $20,559,180 in January, and of exports $48,430,999 against $37,064,127. The average value of imported crude was $1.44 in February against $1.43 in January and an average of $1.16 through 1946.

New Montana and Wyoming Maps Issued By Survey

Two new maps of the Kevin-Sunburst oil field in Montana have been issued by the U. S. Geological Survey, one covering Twp. 35 n., R. 3 w, and the other Twp. 36 n., R. 3 w, both in Toole County.

The first map covered about half of the township, which has become the most active area in the dome, with seven distinct pools developed. The second map includes a rather barren portion of the north flank of the dome, where the only area of production found is the Thorpe pool.

Copies of the maps, each of two sheets, are available at 10 cents each from USGS in Washington, Denver, Casper, Wyo., and Billings, Mont.

The survey also has issued a new chart showing columnar sections of the Tertiary rocks east of Jackson Hole, Wyo., which, while probably containing no oil and gas in commercial quantities, have a bearing on the oil and gas possibilities of deeper rocks of Cretaceous age in the same general region.

Issued as Chart 27 of the Oil and Gas Investigations series, copies are available at 60 cents each from the Washington, Casper, Wyo., and Denver offices.

Red Cross Gets Funds

The Wildcat Committee of the Western Oil and Gas Association in a distribution of net proceeds from the 1946 benefit Christmas Jinks, has sent checks for $500 to each of the American Red Cross Chapters in the following oil centers: Bakersfield, Coalinga, Los Angeles, Taft, Santa Maria, and Ventura.

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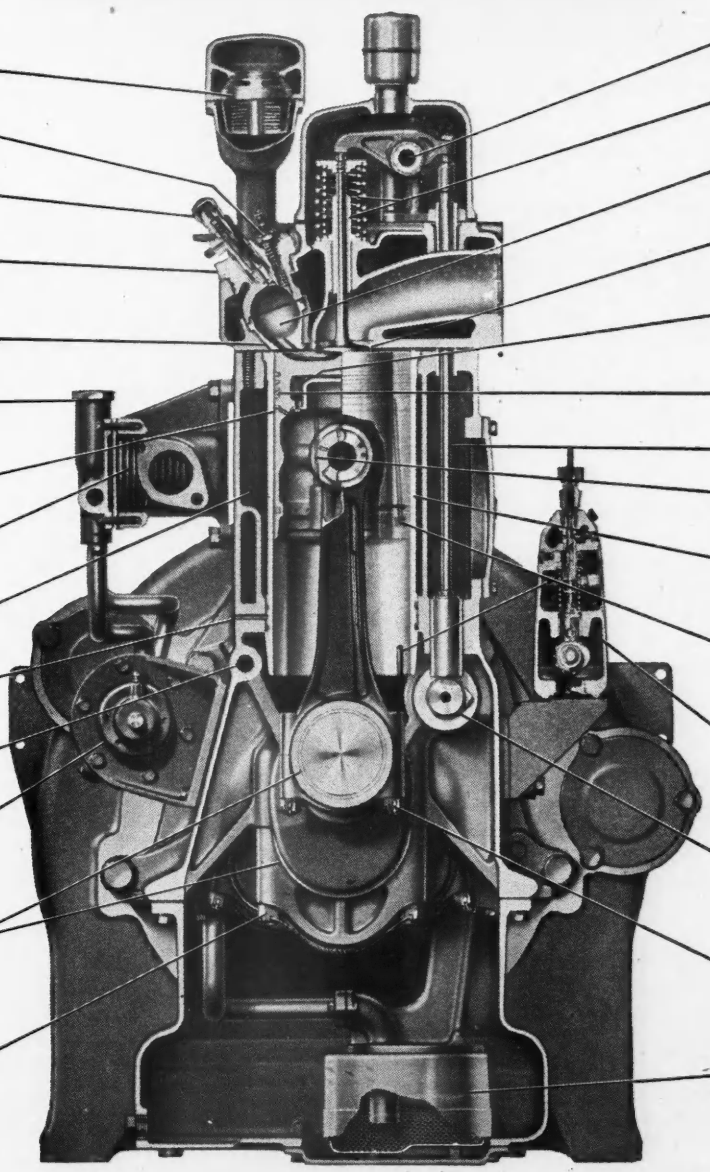

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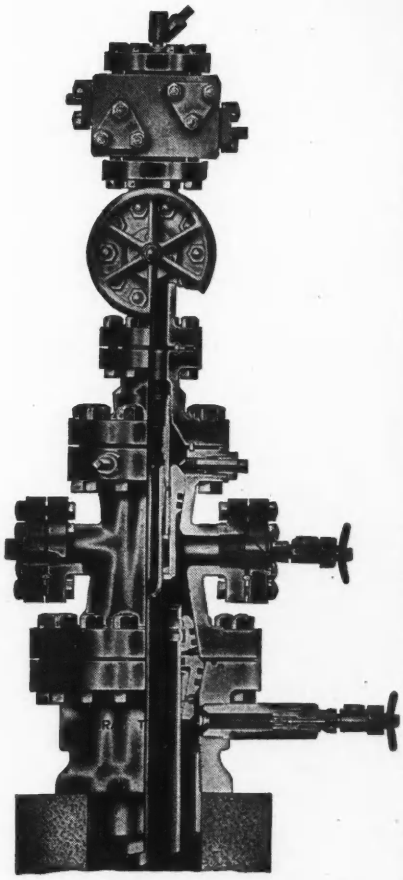

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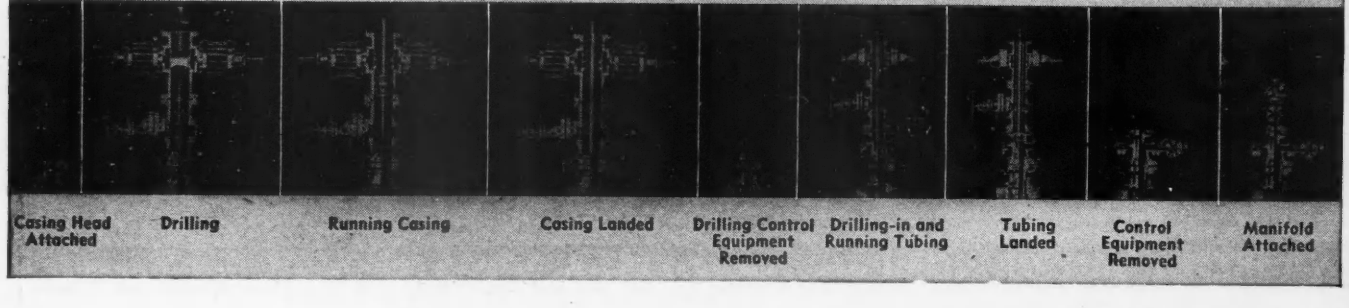

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Memo from the Editor

The greatest exploratory campaign in the history of the world is under way. Geophysical, geological, aerial photographing, and drilling crews are pushing the search for oil in almost every country where the possibility of finding oil exists.

This is not the spot result of the recently increased demand, but is part of long-range planning on the part of oil companies.

Some of these wildcat wells will result in new fields before the year is out. Many will result in further exploration. ALL combine to increase the world-wide aspects of the oil business.

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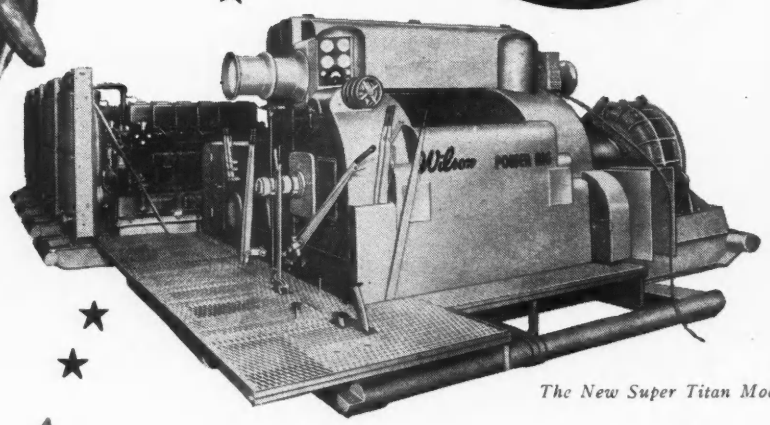

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ANALYSIS OF Arabian Crude

SAUDI ARABIAN crude petroleum is referred to as sour crude since it contains from 1.3 to 1.6 percent sulphur by weight. However, its nature is such that it responds extremely well to ordinary field stabilization processes, and all of the crude for offshore shipment is stabilized. Heat treatment at 200 degrees Fahrenheit has been found sufficient to drive off all of the hydrogen sulphide, and the remaining sulphur in the stabilized crude is from 80 to 90 percent thiophene sulphur—relatively stable, inert and non-corrosive as such at all temperatures below the cracking range (900° up). At cracking temperatures above 900° the components begin to break down enough to allow the formation of more hydrogen sulphide, in which case only the standard alloy protection in use in all cracking equipment is needed. In refining processes most of the sulphur is carried through and remains in the residuum.

The crude ranges from as low as 34° to as high as 37° in gravity, with the result that the common stream will vary somewhat between about 35° and 37°. Most crude from the Dammam field runs around 35° whereas that from Abqaiq is about 37°. Present take from the two areas is about equal. The salt content is no problem since there is only a trace and salt will run from zero to an extreme high of 6 pounds per thousand barrels.

Cracking equipment requires standard corrosion protection in furnace tubes, vapor lines, vessels and towers commonly employed in cracking units in general. Naphtha reforming equipment, because of relatively low sulphur content in the lighter overhead fractions, requires standard alloy protection in only certain strategic points—the hottest tubes.

Current stabilization capacity does not take care of the entire output from the area, but takes care of all shipping needs plus the needs of the Bahrein refinery. The Ras Tanura refinery runs on a mixture of stabilized and unstabilized crude.

The sulphur in straight-run gasoline is about 50 percent mercapatan sulphur. The gasoline responds readily to standard forms of sweetening processes such as lead sulphide, doctor sweetening and solutizer sweetening, etc.

The gasoline octane is low because the crude is paraffinic in type, being about 45-octane number for 390-end point gasoline; however, the sweetened gasoline does have an excellent response to lead and the heavy naphtha responds readily to reforming with octane appreciation up to 75-octane for the deeper reformed naphthas. The residuum yields substantial quantities of cracked naphthas of octane approximating 68.

One hundred-octane aviation gasoline was being produced from this crude at the Bahrein refinery until the end of the war, alkylation and catalytic cracking processes being utilized. Motor gasolines meeting most standard specifications used in the world today can be made by normal processes.

Kerosine qualities are good, and here again the sulphur is relatively low. A properly selected kerosine distillate approximating 10 percent yield from crude can be sweetened to an acceptable burning grade kerosine. Larger yields can be taken which can be refined by either sulphur dioxide or acid treating to marketing grades.

The gas oil is typical of paraffinic crudes—high in diesel index and cetane values. Automotive types of diesel fuels of 58-60 natural cetane values can be produced.

Residual fuel oils can be cracked for more gasoline yield and octane appreciation or it can be marketed as fuel. Although most of the sulphur remains in the residuals, Persian Gulf refineries have been marketing industrial and bunker fuels from Arabian crude for many years. The United States Navy during the war was taking practically all of this residual fuel as special navy fuel and is continuing purchase of all of its Far East requirements of these fuels.

The crude contains good yields—up to 17 percent from crude—of a full line of lubricating oils whose natural viscosity index will run from 60 to 80 and can be treated to 95 or higher with modern solvent extraction and de-waxing processes.

An acceptable grade of asphalt can be obtained but the yield is rather low, being on the order of 7 to 8 percent. The residuum can be air-blown to obtain yields of 13 to 15 percent of asphalt which can be emulsified with the addition of emulsifying aids such as stearine pitch.

At top of page—cooling tower at one of the crude stabilizer units at Dhahran.

Photo by Robert Yarnall Richie for Arabian American Oil Company.

Analysis of Saudi Arabia Crude Oil

	Dammam Field	Abqaiq Field
CRUDE PROPERTIES		
Gravity, API	35	37
Viscosity (Saybolt @ 100)	41	40.2
Pour Point, Deg. F	—15	—15
Sulphur—Weight Percent	1.4-1.6	1.3-1.5
Paraffin Wax (Holde Percent)	2.0-3.8	1.7-3.1
YIELDS BY VOLUME:		
Gasoline—340 Deg. E.P.	23	26.3
Gasoline—390 Deg. E.P.	30.8	34.5
Kerosine—After 340 E. P. Gasoline	23.2	20.5
Kerosine—After 390 E.P. gasoline	10.8	8.7
Gasoil after 390 E. P. gasoline	42.0	38.0
Residual after 390 E. P. gasoline	69.2	65.5
Residual after 400 visc. kerosine	58.4	56.8
Residual after 40 visc. gasoil	27.2	27.5
STRAIGHT RUN GASOLINE TESTS:		
340 E.P. Gasoline:		
Gravity	61.7	66.3
Initial boiling point	105	85
Final boiling point	340	340
Percent off at 212 °F	31	36
Sulphur (weight percent)	.032	.037
390 E.P. Gasoline:		
Gravity	58.2	61.6
Initial boiling point	111	91
Final boiling point	390	390
Percent off at 212 °F	20	25
Sulphur (weight percent)	.035	.040
Kerosine After 340 E.P. Gasoline:		
Gravity	43.9	45.5
Initial boiling point	370	363
Final boiling point	514	560
Viscosity—Saybolt Thermo at 60 °F.	360	360
Sulphur (weight percent)	.18	.20
STRAIGHT RUN TESTS:		
Kerosine After 390 E.P. Gasoline:		
Gravity	43.6	44.4
Initial boiling point	406	414
Final boiling point	486	475
Viscosity (Saybolt Thermo at 60 °F.)	400	400
Sulphur (weight percent)	.15	.20
Gasoil After 390 E.P. Gasoline:		
Gravity	35.0	35.1
Initial boiling point	426	430
Final boiling point	742	722
Percent off at 572 °F	52	53
Viscosity, SSU at 100 °F	40	40
Sulphur (weight percent)	1.13	1.10
Residuum After 390 E.P. Gasoline:		
Gravity	26.5	26.7
Viscosity (SSU at 130 °F.)	62	66
Viscosity (SSU at 210 °F.)	39	40
Sulphur (weight percent)	2.0	1.9
Residuum After 400 Visc. Kerosine:		
Gravity	23.8	24.2
Viscosity (SSU at 130 °F.)	97	96
Viscosity (SSU at 210 °F.)	46	46
Sulphur (weight percent)	2.2	2.1
Residuum After 40 Visc. Gasoil:		
Gravity	15.3	16.0
Viscosity (SSU at 130 °F.)	1450	1369
Viscosity (SSU at 210 °F.)	179	175
Sulphur (weight percent)	3.1	2.8

THE BARCO CONCESSION, Colombia

By GEORGE O. IVES
Staff Writer

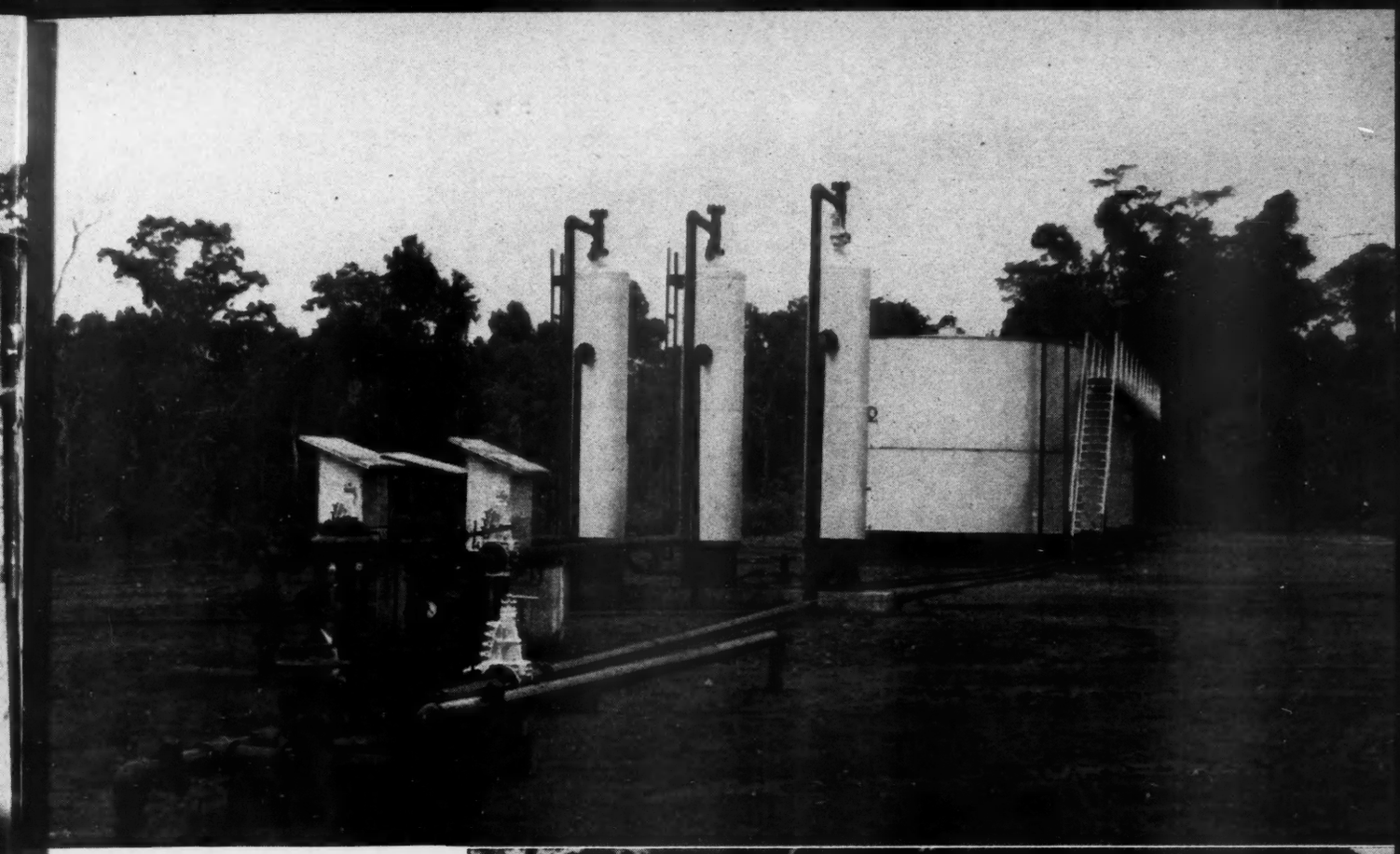
FEW of the world's oil properties can boast of a more interesting history than that of the Barco concession in the wild, rugged territory of northeastern Colombia. Although it was the first oil concession ever to be granted in the nation, dating back to 1905, and although the presence of oil on the concession has been known since that time or before, it was not until 30 years later, and after passing through several changes in ownership and management, that the first oil was run commercially from the property. The Barco is also the site of the first refinery in the nation, a crude still for producing kerosine from seepage oil for local consumption. The old still remains as a landmark, but the present operators of the concession have installed and are now operating a small, modern refinery capable of producing enough of a complete range of petroleum products to supply the demand for the region — a region containing one fair-sized city and a number of smaller communities.

Successful operation of this concession has involved, through the years, a constant battle of supply and transportation and a continuous state of vigilance to protect personnel from sporadic forays by hostile Indians, one of the few remaining races of people on the globe who are completely uncivilized and who will not tolerate the slightest contact with foreigners or nationals other than their own tribe.

Between 1920, when oil was first found at Rio de Oro, in the extreme northeast corner of the concession, until 1939, when the pipe line to the coast was completed, the Petrolea field had been discovered, and geological work had indicated possibilities for other producing areas, but the Rio de Oro, due principally to its isolation, and relatively small size, has never been exploited other than by 10 oil wells drilled to establish and partly define the field. La Petrolea field, on the other hand, was believed to be of sufficient importance to justify the outlay of funds for building the pipe line, and with this as the nucleus of reserve, serious exploitation of the concession got under way with Colombian Petroleum Company (jointly owned by Socony-Vacuum Oil Company and The Texas Company) as the operator. Since then Tibu field was discovered and has taken its place as an equal producer with Petrolea. In 1945, Tibu produced 27.8 percent of the Barco's output. During 1946 Tibu's total production was 47.2 percent of the Barco and at the end of the year it was making 11,220 barrels daily of the Barco's 20,769-barrel total. The investment of the company in this area has been tremendous and it remains to be seen whether it has been fully justified, since much exploratory work remains and Tibu, the more important of the areas discovered thus far, is still undefined as to area and possible reserve. By the beginning of March, 1947, slightly more than 30.3 million barrels had been recovered commercially from the concession.

At top of page—Well No. K-21, deepest test in Tibu, hooking up Christmas tree for first test of the Cretaceous. This well extended production more than two miles.

Situated just inside the national boundary between Colombia and Venezuela, the Barco concession is near the southwestern edge of the Maracaibo Basin, east of the Sardinata depression and west of the Zulia syncline. It is in extremely rugged territory, being in the eastern edge of the Eastern Cordillera of



A typical tank battery hook-up for Tibu is shown above. At right, is the Christmas tree on Tibu 31, one of the best Tertiary wells in the field.

the Andes Mountains, although the fields of Tibu and Petrolea themselves are in areas with relatively low relief. Until the early 1930's when more or less formal development began, the only reliable means of transportation were two routes, one of which was by water from Lake Maracaibo up the Catatumbo River system by launch and barge to Puerto Reyes, or Puerto Barco, thence by mule trail to La Petrolea. In the dry season it was possible to go by mule trail from Puerto Villamizar on the Cucuta Railroad from the Colombian side. The highway from the Cucuta Railroad to La Petrolea was not completed until 1938, and is a well-engineered road capable of handling heavy hauling, except that equipment must be transported across the river at the railroad end of the highway by overhead cableway.

The climate is typically wet tropical with little variation in seasons other than from wet to dry. The definitely wet season is usually from mid-December until late March, with some rainfall continuing into April and May. Normal rainfall varies from 130 to 150 inches in the southern part of the concession, to as much as 200 inches annually in the Rio de Oro area to the north.

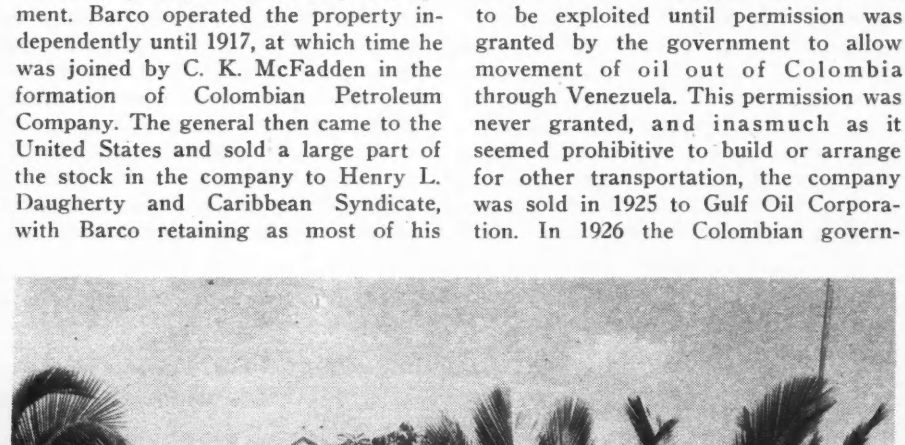
In 1905 the concession, with an area of 414,000 hectares (1,022,994 acres) was granted to General Virgilio Barco, who intended commercializing petroleum possibilities. After preliminary work, the grant was re-affirmed in 1908, and im-

Pipe line pump station at Petrolea field base camp in Barco Concession, Colombia.

mediately thereafter General Barco built his still and started refining into kerosine some seepage oil found near the present Petrolea camp. It has been reported that this early activity was for the primary purpose of proving development. Barco operated the property independently until 1917, at which time he was joined by C. K. McFadden in the formation of Colombian Petroleum Company. The general then came to the United States and sold a large part of the stock in the company to Henry L. Daugherty and Caribbean Syndicate, with Barco retaining as most of his interest, an overriding royalty of 15 percent. In 1920 the company drilled in the Rio de Oro area and found oil with commercial possibilities at 814 feet. At this time there was a proviso in the contract that the concession did not have to be exploited until permission was granted by the government to allow movement of oil out of Colombia through Venezuela. This permission was never granted, and inasmuch as it seemed prohibitive to build or arrange for other transportation, the company was sold in 1925 to Gulf Oil Corporation. In 1926 the Colombian government declared the concession void for non-compliance with the terms of the original contract, and after several years more, a contract was signed in 1931 by South American Gulf Oil Company and Colombian Petroleum Company with the government, under which it is now being operated. The term of the contract being for 50 years, or until August, 1981.

The first well was drilled at Petrolea field in 1931, proving production in that area, but it immediately caught fire and required the services of expert firefighters from the United States before being extinguished. The Gulf organization drilled at Rio de Oro at Petrolea between 1931 and 1936 without having established a pipe line outlet, and in the middle of 1936 the Colombian Petroleum Company was sold to The Texas Company and Socony-Vacuum Oil Company. Throughout the transactions the Barco family has retained a royalty interest which, under the present contract amounts to 3½ percent at the terminal port. The original contract called for a 16 percent royalty to the government, which now gets 10 percent in the field or 6 percent at the seacoast. When the Socony-Texas group acquired the properties four wells had been drilled at Rio de Oro and 17 wells at Petrolea. The new management gradually took over operations, and it was not until January of 1938 that the last of the Gulf personnel had been replaced.

The survey for the Sagoc pipe line from Petrolea to the terminal at Coveñas on the Gulf of Morosquillo was started in September of 1937, and most of the construction was carried out in 1938-39



Club for staff and technical personnel at Petrolea. Has library, billiard table, refreshment and other recreational facilities.

Suspension bridge on company-built highway between Petrolea and Tibu. These bridges carry pipe lines as well as road traffic.

at a cost of $25 million. The 12-inch, 265-mile pipe line was built under extreme difficulties, the first part being through rugged mountains and forest, and the last half being for the most part through the Magdalena River valley, much of which is inundated through a good part of the year. The line has a present capacity of 25,000 to 28,000 barrels with three stations operating, all of which are within 69.5 miles of the origin of the system, since the line starts at an altitude of only 222 feet and inside the first 76.5 miles rises to an altitude of 5260 feet to cross the Rieber Pass. From that point, nearly 190 miles to the ocean terminal there are no more pump stations, but one station is used as a relief station where crude is run into and out of tanks to cut the tremendous head pressure given by a one-mile drop.

The Petrolea station pumps the first 45.5 miles against a head of 2000 feet. The Tarra station pumps 24 miles against an 800-foot head, and the Convencion station has to raise the oil 2190 feet in 7 miles, after which the flow is all gravity. The relief station, at an altitude of 2500 feet, is equipped with automatic valves to divert flow to the relief tanks as pressure builds up too high. Telephone system extends throughout the line, and radio stations have been installed at three points.

Identical equipment is in the three operating stations, each having two units consisting of 6-stage, 6-inch centrifugal pumps driven by 6-cylinder 750-horsepower diesel stationary power plants. The pumps operate through speed increasers at 3600 revolutions per minute against 800 to 1000-pound line pressure. Each unit can handle 1000 barrels per hour. The ultimate pipe line capacity with eight designed stations in operation would be 75,000 barrels daily. Under the present system of operation, the main line originates at Petrolea and Tibu production is brought into that station through a 6-inch and a 4-inch line, the smaller line handling the current production from the Cretaceous at Tibu. With increasing production from Tibu and declines at Petrolea it is planned to move the main station to Tibu and bring Petrolea crude in through the secondary lines.

Rio de Oro and La Petrolea

The Rio de Oro field has not been drilled since 1941. Of a total of 13 wells, eight are capable of production, although shut in for lack of pipe line connection. The field has never been produced except for fuel for drilling purposes.

The Petrolea field, opened in 1931, is on an asymetrical anticline, and has 128 producers, in six producing zones, all in the Cretaceous and all shallow, varying from 99 feet to as much as 1500 feet. One zone, the shallow La Luna, has been abandoned as a producing formation. Other zones are La Luna, Ostrea Bed, Zones 1, 2, 3 and Zone 4-Uribante. Zone 4-Uribante is the best producing horizon in the field, having 28 producing wells out of the 60 now on production, and accounting for about 7600 barrels daily of the field's 9600-barrel output. The field covers a total surface area of some 4250 acres, and the Zone 3 formation is the most extensive, covering some 2800 acres. The most effective water drive is in Zone 4-Uribante. There are seven pumping wells, the field for the most part flowing. Production is restricted to a relatively small draw-down of 30 to 60 pounds per square inch. Gas-oil ratio for the field averages about 375 to 1, not including the shut-in wells. In all, 33 wells are shut in on account of high gas-oil ratios, and seven wells are shut in on account of excessive production of salt water. Crude from the field averages about 47 degrees gravity. Total cumulative production to the first of March has been 24,247,472 barrels. There is no drilling activity at Petrolea.

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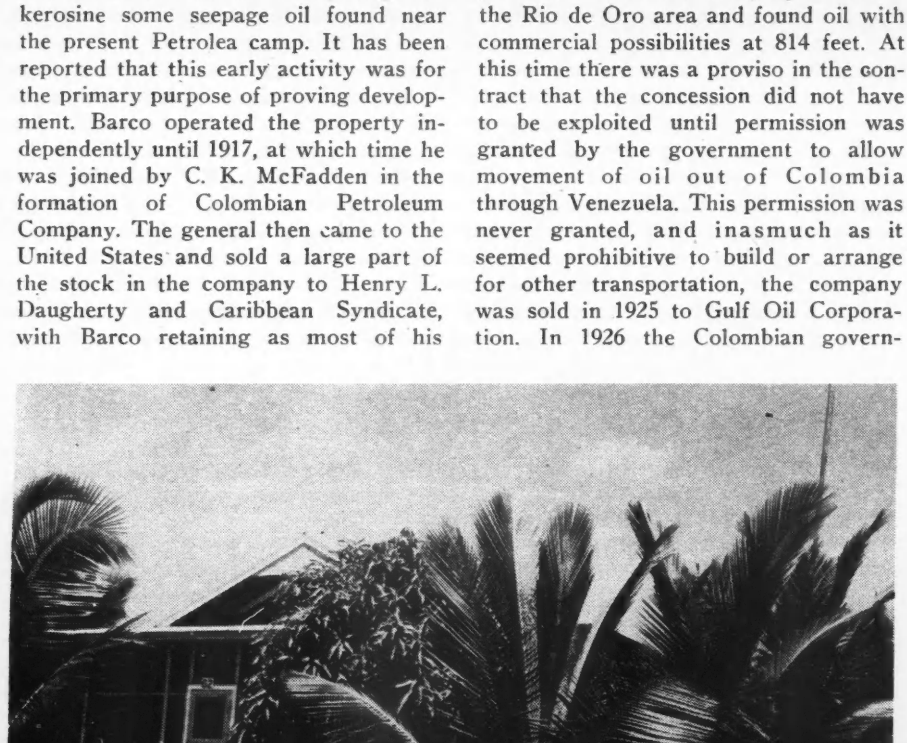

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Portion of warehouse area in Tibu camp. Facing these buildings are machine shops, supply sheds for drilling and clean-out tools, repair shops, power plant, etc.

from 1940 to 1944, but development has been steady since and there are now 42 wells producing, three of which are from the Cretaceous, the remainder being Tertiary. Six rigs are kept running, four being used for Tertiary development, and two for Cretaceous drilling. The deep wells have been altogether of exploratory nature, taking from 9 months to more than a year to complete, so no estimates of average drilling time are possible. The Tibu 21-K well was spudded February 5, 1945, and reached total depth of 10,876 feet as the field's deepest well on July 25, 1946. This well used 215 rock bits in 9368 feet.

Tertiary wells are drilled to 4900 or 5400 feet, depending on whether or not the Catatumbo pay is taken in. Average drilling time is 30 to 45 days, so that by the time moving in and rigging up is taken into account, it is possible to drill about five wells per year per rig. It is all rock bit drilling, with wells using about 50 bits each. Two principal pays are drilled—Barco and Catatumbo. The Catatumbo is actually thought to be in the upper Cretaceous, but is carried with the Tertiary since it has the same characteristics as the Barco and also in order to distinguish it from the Cretaceous limestone which is found 3000 feet lower. Five producers, including one dual completion, are in this formation. The Barco sand, topped at from 4300 to 4500 feet, has an effective pay thickness of 60 feet, ranging from as little as 15 feet in one well to as high as 140 feet in 350 feet of section. The Catatumbo has about 60 to 70 feet of separated pay sand in as much as 450 feet of section topped at about 5000 feet. In step-out drilling the wells are usually drilled through the Catatumbo, but the majority of exploitation wells are now drilled only through the Barco sand. Gravity of the Barco crude averages 32 degrees, that from the Catatumbo running from a degree to a degree and a half higher. Average gas-oil ratio is 460 to 1.

Casing program for Tertiary wells is to drill 12¼-inch hole to about 700 feet before setting 9⅝-inch surface pipe, and then to drill 8⅝-inch hole to total depth and set 6⅝-inch casing to an average of 4800 to 4900 for Barco sand wells. Three systems of completion are used, decided upon after examination of logs. Some are set on top of the sand and completed "barefoot"; others set to top of the best sand and have a "barefoot" and half gun-perforated completion, while in other wells the pipe is set through the sand for perforation. Thus far no water is being produced from Barco sand wells. One small Catatumbo well on the south side of the Socuavo anticline is showing some water.

Three Completions

In the Cretaceous, three wells have been completed, one of which is still testing, and one, the first drilled, is not yet producing. Tibu 4-K was placed on production January 1, 1946, making 625 barrels daily through a 5/16-inch choke with gas-oil ratio of 6400/1. This well produces most of the gas used for field drilling and camp operations including the brick plant. Production is from the Tibu member of the Uribante in the Lower Cretaceous just above the metomorphic basement rocks. It produces from lime and sand pay between 8775 and 9225 feet. The upper member of the pay is Tibu limestone, and the lower part is hard salicious sand. Flanks of both domes at Tibu are being prospected with deep wells for the purpose of defining the extent of this deep pay. The first well, drilled on the north dome, is not yet connected by pipe line, but is capable of producing several hundred barrels daily of 52-gravity oil at a ratio of around 10,000 to 1.

The area at Tibu field proved by drilling now covers only about 3000 acres, but drilling has thus far borne out the geophysical work, and the geophysical and subsurface interpretation shows something like 30,000 acres of closure. One of the Barco sand wells has produced more than a half million barrels and is still producing at flush rates.

Two main camps are maintained on the Barco concession, having complete living facilities for more than 1800 men regularly employed. These facilities include living quarters, mess halls, clubs for recreation, steam laundry, hospital and dispensaries. Meat is supplied from herds maintained on the concession, and contractors on the concession grow quantities of corn, yuca, and platano which are staple national foods. Fresh eggs and fresh vegetables are hauled out from Cucuta by railroad and flow in by air. Special trains are chartered to move laborers from the field to Cucuta over weekends, with most of the technical personnel being transported by plane.

All heavy equipment must come in through Maracaibo, Venezuela. It is brought on lake barges to Encontrados on the Catatumbo River, thence on up this and the Tarra River to Tres Bocas, a port built near the Tibu field, and then hauled to points on the concession by truck. Urgent items come by air.

Tankage available at the Petrolea terminal end of the pipe line totals 330,000 barrels capacity, half of which is used for Tertiary crudes and half for Cretaceous crudes. There being 14 degrees difference in gravity, the two crudes are batched separately through the line. At Coveñas the main tank farm consists of ten 118,000-barrel tanks, two of which are set aside for fuel oil service to be used in bunkering ships. The loading station is equipped with three 225-horsepower diesel 4-cylinder motors driving two-stage pumps which draw from the tanks through a 24-inch suction line and discharge into ships at the dock through a 20-inch line. A 12-inch submarine line leads out to an offshore loading point. Ships can take cargo at the rate of 10,000 barrels per hour at the dock where they are loaded to 27½-foot draft and then moved out offshore where they are loaded to 32 feet through the submarine line. Only one ship can be handled at a time at the dock.

The pipe line organization, operated under the name of South American Gulf Oil Company, although owned by the Socony & Texas Company group, has an organization of 400 to 450 men.

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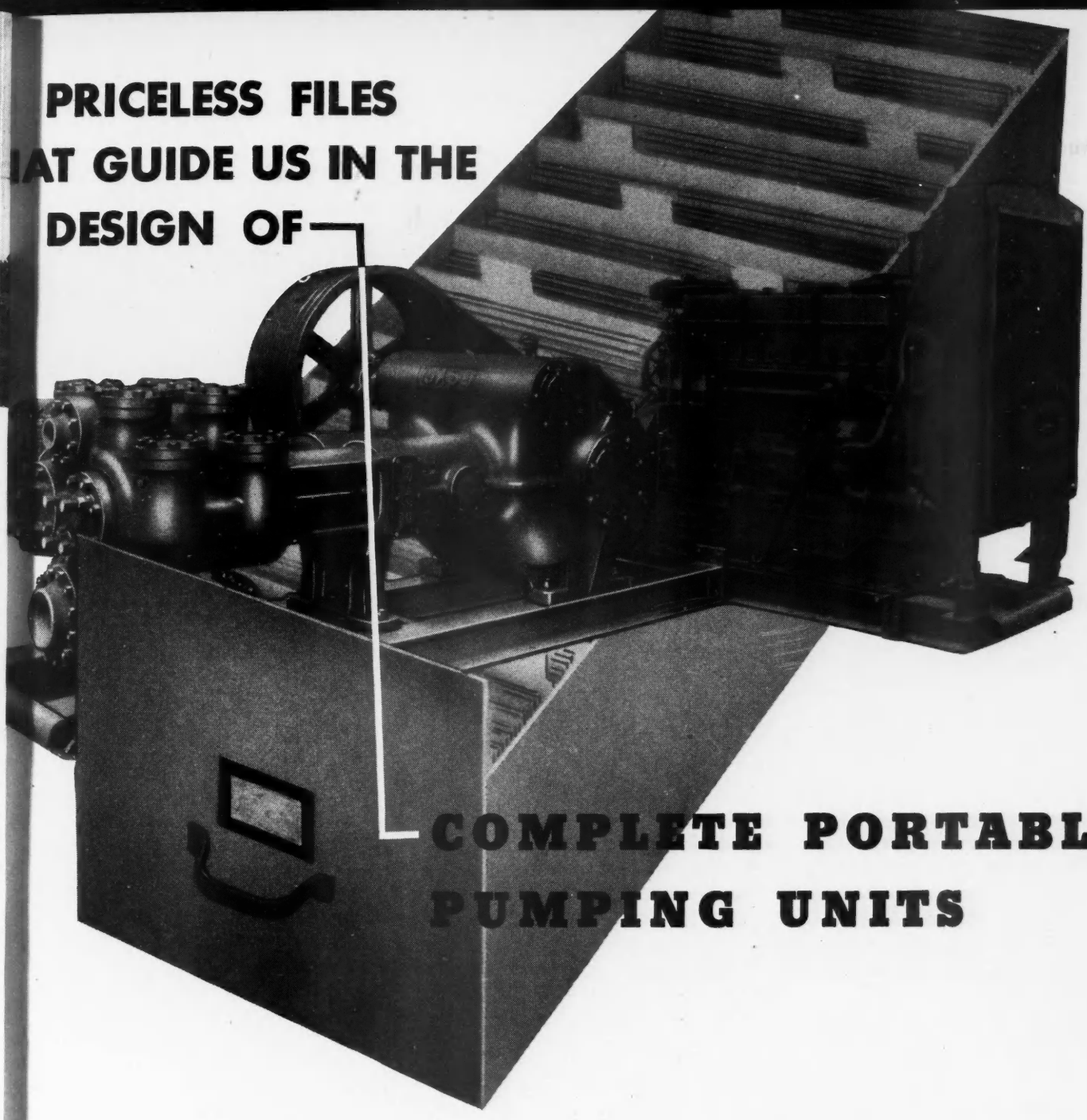

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The SEARCH FOR OIL In Northwest India

By
E. N. TIRATSOO
Staff Writer

IT was only seven years after Colonel Drake drilled his famous well in Pennsylvania that the search for oil in India began. It is therefore true to say that the Punjab, the vast province of northwestern Indian plains, was the first area of the British Empire in which oil was sought.

In 1866, the Public Works Department of the Punjab government drilled the first shallow test wells in the Attock district on the evidence of numerous oil seepages. Four years later an American, B. J. Lyman, came to India on the request of the government, and made an extensive survey of the petroleum possibilities of the Punjab. His report, published in 1879, recommended drilling in several localities, although he did not consider that more than a modest amount of oil would be found.

Some shallow wells were drilled as a result of Lyman's survey, and a little oil was found. In 1890 a more systematic discovery effort was made by the Townsend syndicate, which imported Canadian drillers to put down wells at Sudkal, Jaba and Alugud. The yield was small and this project was eventually abandoned, although some of the wells had reached 700 feet.

1913 Operations

In 1912, two exploratory syndicates were formed in Rawalpindi, chief city of the northern Punjab. One, Indolex Company, brought a Swiss geologist, Professor Preiswerk, and an Austrian, Professor Zuber, to direct operations. Two wells were drilled in 1913-1914 on a tight anticline near Golra, five miles north of Rawalpindi. Canadian pole tools were used, and the wells reached about 1300 feet. In spite of the large surface seepages (or perhaps because of them), the wells found only a few gallons of oil.

The second syndicate formed at this time developed into Attock Oil Company. This concern was at the outset managed by Steel Brothers and Company, Ltd., the managing agents of Indo-Burma Petroleum Company operating in Burma.

Attock Oil Company carried out an extensive geological survey of the Punjab area. Early in 1914 they obtained the prospecting licenses of the Khaur and Dhulian anticlines, and in 1915 oil in quantity was found at Khaur. Dhulian proved a much more difficult drilling proposition, and it was not until rotary tools were introduced and local difficulties overcome that this field was brought into full production in 1937.

Besides Khaur and Dhulian, a number of other structures have been tested at various times in this part of Northwest India, both by Attock and by Burmah Oil Company.

Khabakki, in the south, was originally shallow-tested on the strength of Lyman's report, and gave a few gallons a day for several years. In 1916 Burmah Oil Company drilled a deeper well here on a marked anticline in the nummulitic limestone. This hole reached the Lower Eocene, but no appreciable oil accumulations were found.

A test drilled by Attock at the same period at Gobhir, a short distance to the north of the Salt Range oil seepages, gave only a little asphaltic oil with much sulphurous water.

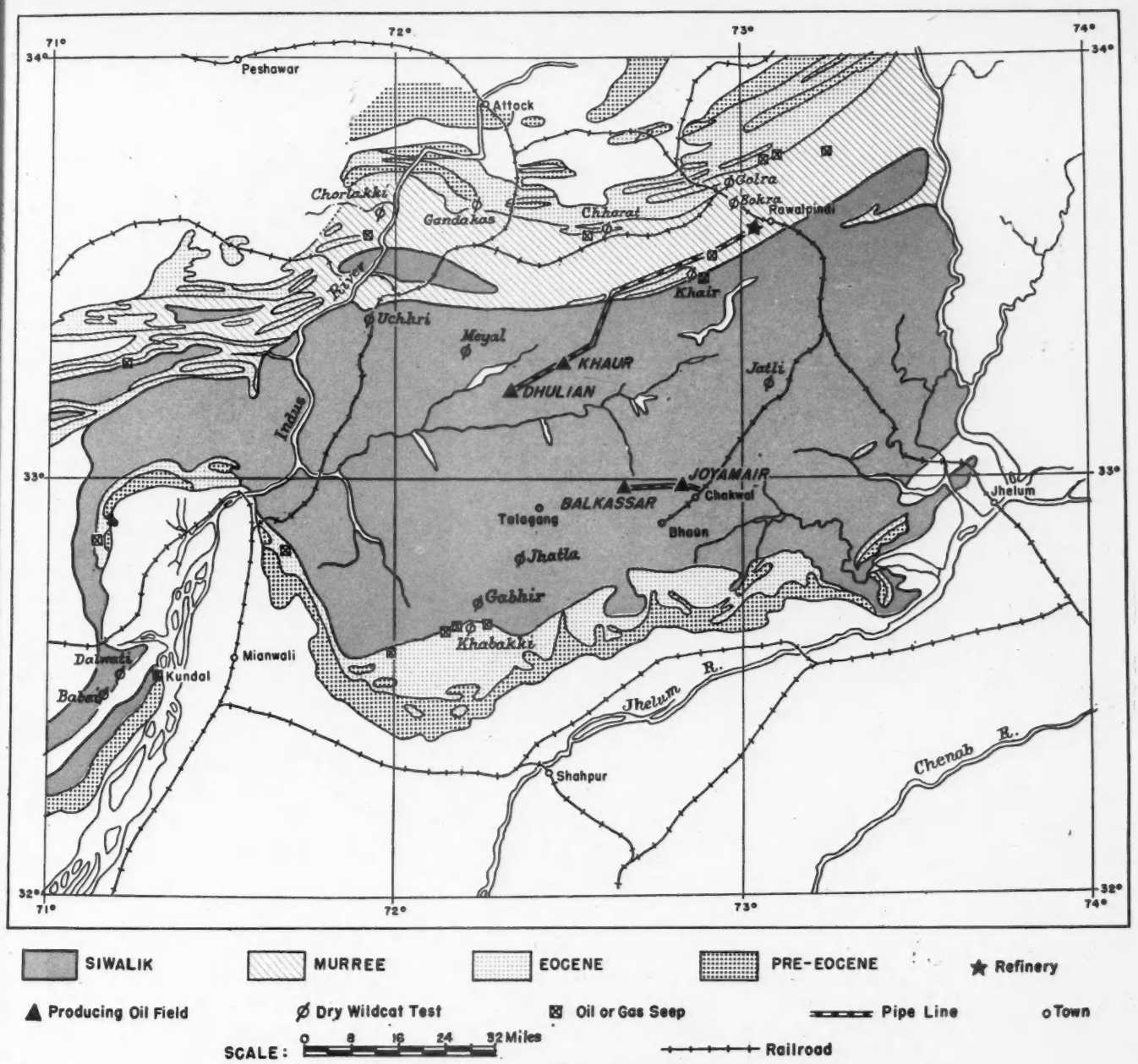
At Jhatla, ten miles to the north, a test well drilled in 1923-1925 by Whitehall Petroleum Corporation on a large open Tertiary dome reached barren Eocene beds at about 6000 feet and was abandoned.

Several wells were drilled by Indo-Burma Petroleum Company to the west of the Indus River, in areas lying within the Northwest Frontier Province. Between 1926 and 1928, three wells were drilled between Dalwatti and Babai on the Marwat Range, a few miles south of the Khurram River. These wells reached about 4,000 feet and found no oil as the Eocene was absent due to unconformities.

In the northeast corner of Kohat dis-

Succession of Strata in Northwest India

Recent	Gravel and Alluvium	
Pleistocene	Conglomerate	
Pliocene	Upper Siwalik Middle Siwalik Lower Siwalik	Chinji beds Kamlial beds
Miocene	Upper Murree Lower Murree	
Oligocene	Fatehjang zone	
	(unconformity)	
Eocene	Upper Chharat Stage Lower Chharat Stage Hill Limestones	Nummulitic shales Limestones and shales
Cretaceous	Limestones	
Jurassic	Shales	
Trias	Ceratite beds	
Premo-Carboniferous	Productus Limestone	
Upper Carboniferous	Speckled sandstones Conularia beds Talchir boulder bed	
Upper Cambrian	Bhaganwala series (Salt pseudomorphs)	
Lower Cambrian	Magnesian sandstones Neobolus beds	
Pre-Cambrian	Attock Slates.	



Geology and Oil Occurrences of Punjab and Northwest Frontier Provinces of India.

trict, a well in 1937 tested the Chorlakki structure, which is a closely compressed fold. Although Eocene rocks were encountered at a moderate depth, the flow of oil was too small for commercial exploitation.

Including the modern tests described below, some 20 areas of Northwest India have been tested, but only four (Khaur, Dhulian, Joya Mair and Balkassar) have yielded oil in commercial quantities. It is estimated that some 88,000 feet of exploratory holes have been drilled without result. Add the footage of unsuccessful extension wells in known fields, and the total is about 140,000 feet.

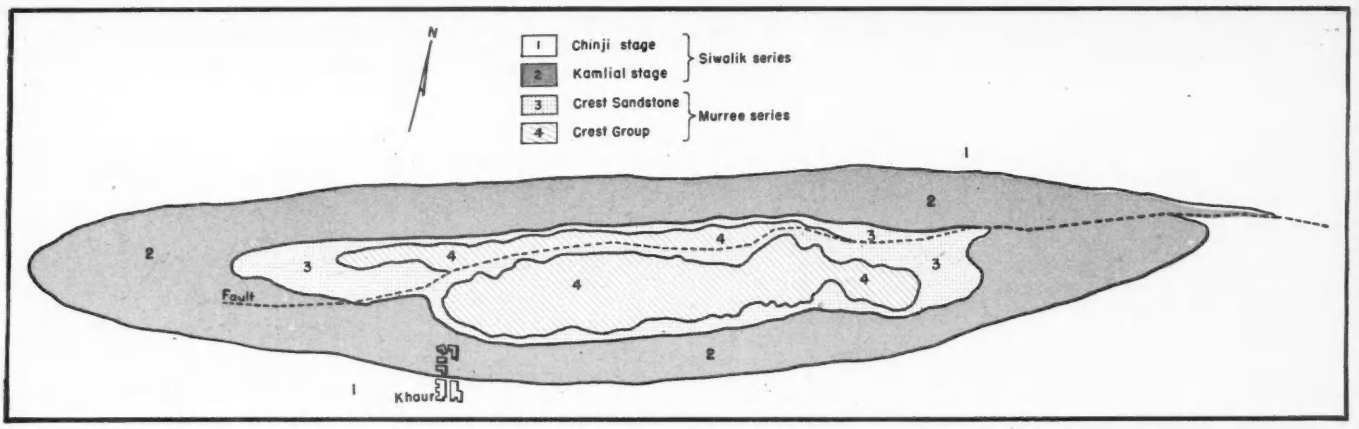
The succession of strata in Northwest India is shown in the chart on the preceding page.

The Upper Tertiary rocks are entirely fresh-water, and the Eocene rocks below the unconformity almost entirely marine in facies. All oil found to date has either been in Miocene Murree sandstone beds or in Middle Eocene limestones. It is generally believed that the oil was formed in Eocene strata (probably Hill Limestones and Lower Chharat beds) and later migrated in part into the porous Murrees.

The Northern Punjab structures are all associated with the great Tertiary folding movement that formed the Himalaya Mountains. It is probable that toward the close of the Cretaceous, Tibet was invaded by the sea of Western India. Southern and Central Tibet were inundated by the same sea that covered what is now the northern part of Sikkim and stretched across the area of the present Himalayas into Afghanistan, Baluchistan and North Africa, being continuous with the Mediterranean. This formed a segment of the older Tethys Sea, and was separated by a land barrier from the Bay of Bengal-Ganges ocean.

A folding movement then commenced, and the hard mass of the Indo-African continent seems to have been forced northward in a great compressional movement which brought about the buckling and folding of the sediments at its northern edge into the preliminary Himalayan chain. Subsequent isostatic uplift and complex mountain building caused the elevation of the Himalayas to their present majestic height.

Structures in the Punjab usually take the form of long, compressed folds, running roughly east-west, parallel with the mountains to the north. Just as in the Carpathian and Caucasian oil areas, the Northwest Indian fields are structurally the result of a "foothill zone" of a Tertiary mountain chain, which has brought about a series of relatively gen-



Map of Khaur Anticline (by E. S. Pinfold).

tle structures in an area of great sedimentary thickness.

That oil-forming conditions were present over a widespread area in this part of India is evidenced by the large number of well-authenticated seepages that have been reported. These seepages occur in three separate zones:

a) Along the foothills of the Margala and Kala Chitta ranges, which extend from Murree through the Rawalpindi and Attock districts across the Indus into the North-West Frontier Province.

b) Along the northern flank of the Salt Range, the largest seepage being at Jaba.

c) At Khaur, 45 miles southwest of Rawalpindi, where there is a considerable patch of oil-soaked sandstone.

Most of these seepages are associated with gypsiferous marls overlying nummulitic shales and limestones, and have probably come up fault planes.

It is likely that deep testing may reveal several more of the numerous anticlines in this area of India are oil-bearing, since suitable conditions for oil genesis undoubtedly occurred, and porous reservoir beds are plentiful. The other two conditions necessary for an oil field to exist at the present day are structure and cover, and there seems no reason why further undispersed structural or stratigraphic traps should not eventually be found.

The Khaur Field

The village of Khaur is upon the Potwar plateau, 43 miles southwest of Rawalpindi. Nearby there is an extensive "live" seepage of oil about 100 square yards in extent. This was first discovered by E. S. Pinfold, Indo Burma Petroleum Company geologist, who also mapped the local anticline, which as a result was taken over by Attock in 1914.

The Khaur fold, an open one, is only slightly asymmetric. Maximum dips on either flank are 45-50°, the crest is rounded and the pitch is gentle to the ESE and WSW. There are one or two very minor dip and strike faults which are structurally insignificant. Murree beds are exposed in the core of the fold, being followed by ridges of the harder Siwaliks.

The Attock company took out a prospecting license covering 9 square miles of this structure in July, 1914, and started drilling in 1915. In that year they took over another 5 square miles. By the end of 1917, five wells had been drilled, and by 1935 the wells numbered 228. Today there are about 350 wells on the Khaur structure, only one of which is flowing, the remainder being on pump. The proved productive area is about 100 acres.

At Khaur, oil was originally produced from the shallow depth of 215 feet, and a number of other shallow horizons were subsequently tapped. The producing formation was the locally porous and fissured Murree sandstone, and this gave oil in several zones down to 5000 feet. Oil was also subsequently discovered in the Eocene limestone underlying the Murree beds, and it is thought that this is the source horizon. The oil is about 35 gravity (API).

Original production rates were high, but the pressure soon declined. The peak yield was 500,000 barrels in 1929, but today the output is only about 300 barrels daily.

Oil from Khaur and Dhulian is transported by a 52-mile pipe line to the Attock refinery at Rawalpindi. The crude charging capacity of this plant is 4000 barrels daily, with additional cracking capacity of 2500 barrels daily.

The Dhulian Field

The Dhulian anticline lies 10 miles southwest of the Khaur fold, to which it is structurally in echelon. This dome is about the same length as that at Khaur, but is broader and flatter and much dissected by streams. Maximum northward dip is 50°, and southward dip 30°. Faults are few and insignificant, and the Murree beds are not exposed, the core being formed of Chinji sandstones.

Dhulian, the largest producing area in Northwest India, has a proved area of about 900 acres, and there are 35 flowing wells. The oil is of 36.8 gravity (API) and comes from the Eocene limestone at depths of around 7000 feet. Drilling is complicated by heaving shales and high formational pressures, which may owe their origin to the hydraulic control of reservoirs exercised by the nearby Himalaya Mountains.

Although the prospecting rights for Dhulian were obtained at the same time as those for Khaur, drilling difficulties held back until 1937 the first deep test. The first two wells completed flowed 1200 barrels daily, and high hopes were held for the field's potential. However, production has dropped rapidly, due to water encroachment and the limitation of the vertical oil-bearing section, so that present production is only about 700 barrels daily. There is still considerable pressure in the Dhulian reservoir, and all production is obtained by natural flow.

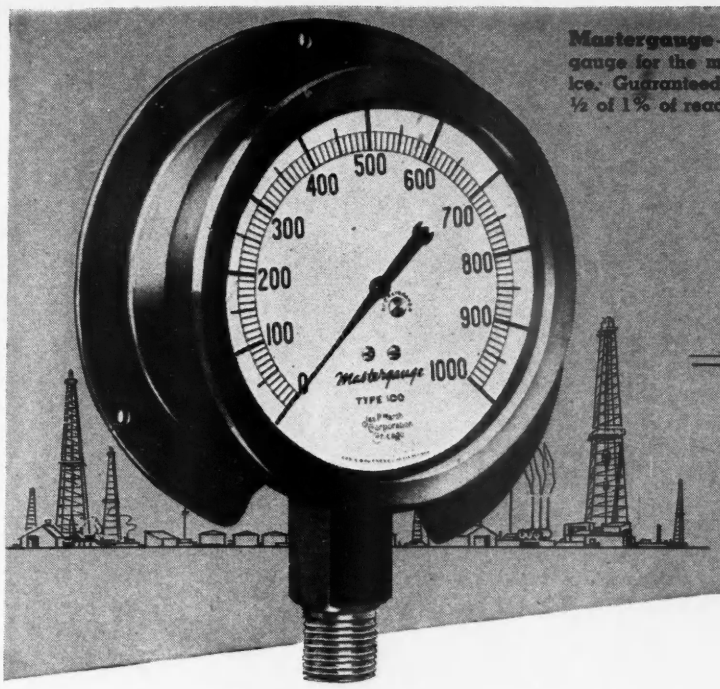
Extensive use has been made of electrical coring without marked success. Correlations are difficult in the Siwaliks, due to the absence of microfauna. However, once the Eocene is reached, micropaleontology can be used as a correlative aid.

Joya Mair

In 1929, D. N. Wadia, assistant superintendent of the Geological Survey of India, discovered an anticline with a dome termination and steep pitch, which by nosing some one and a half miles south of Joya Mair village produced a "semi-dome" structure with an overall area of 10 square miles.

The Joya Mair structure occurs 25 miles south of Khaur on a dissected plateau of Middle Siwalik rocks capped by alluvium, and forms the WSW extremity of a long anticline which strikes ENE towards Padshahne.

The Chinji beds are exposed to a thickness of about 1000 feet in the center of the fold, and their total thickness here is some 3000 feet. They are overlain by the grey, soft sandstones of the Middle Siwaliks, which constitute some five-



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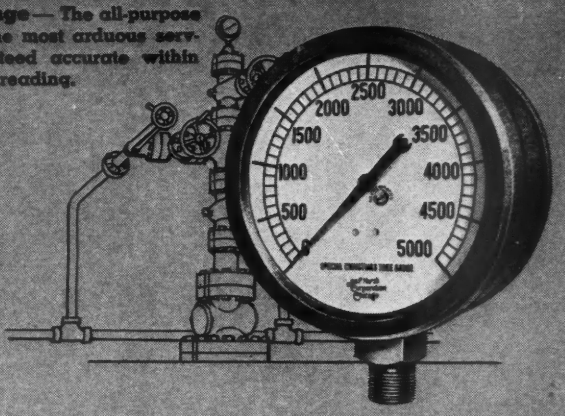

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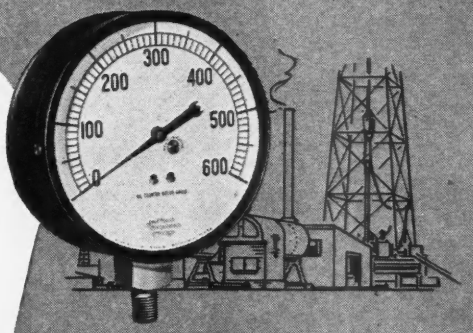

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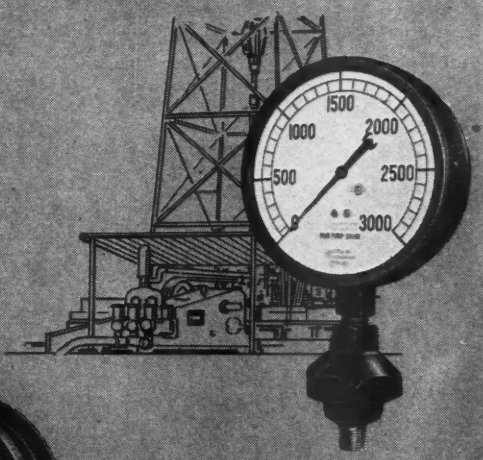

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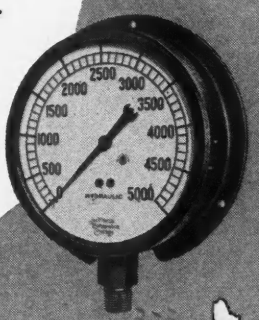

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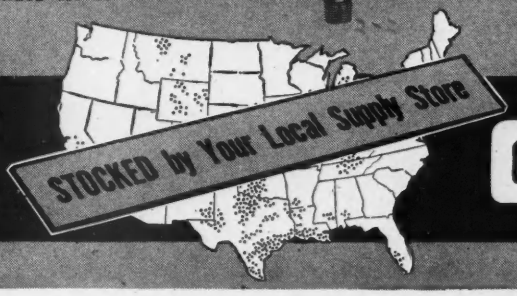

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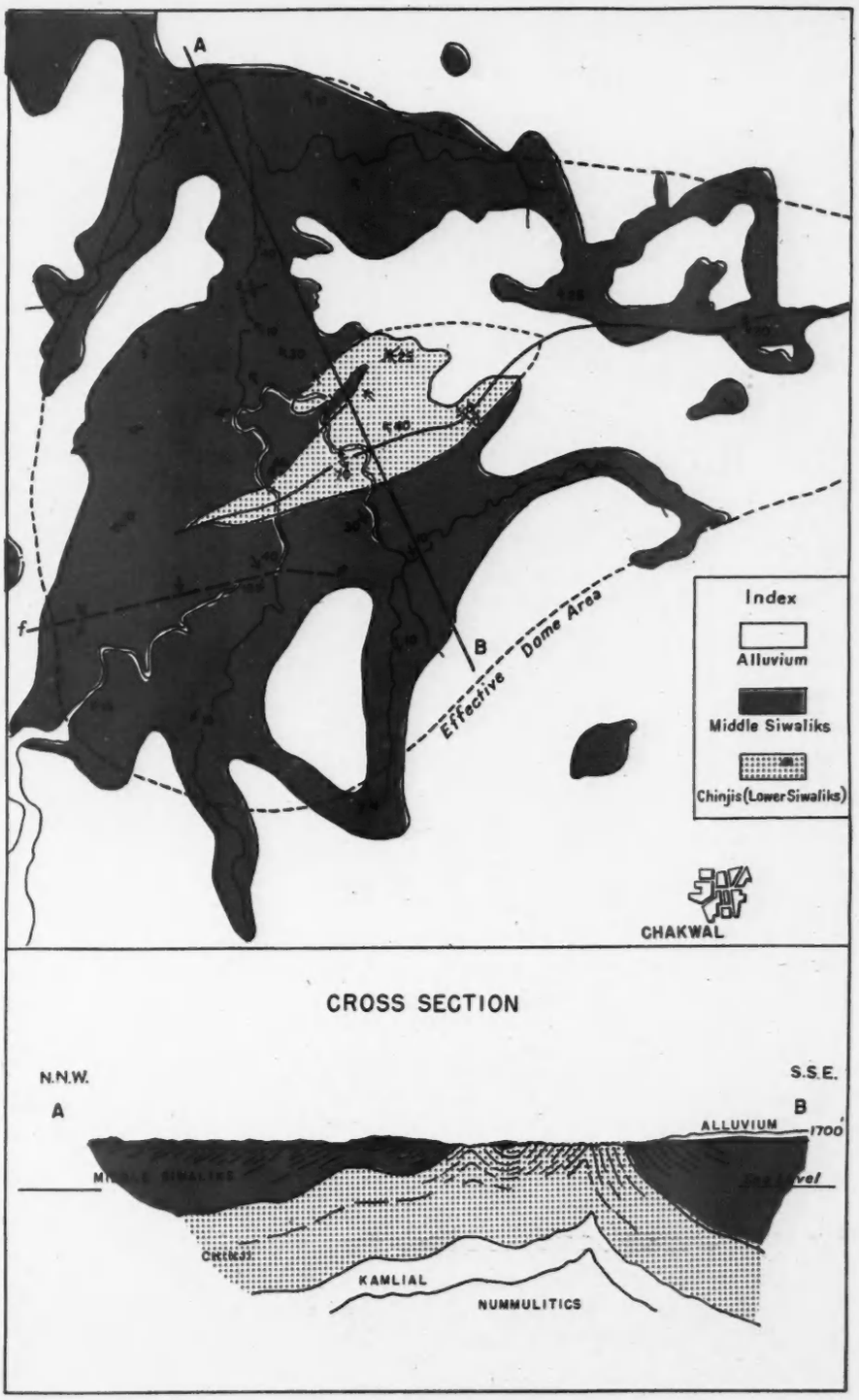
sixths of the area of the dome. These latter beds are in turn covered, after a thickness of 4000 feet, by the Upper Siwalik clays and sandstones along the northern and western periphery of the dome.

The Joya Mair dome has a rather steep, asymmetrical crest. The narrower, southern flank has an inclination of 60-70°, gradually diminishing to 10°, while the opposite broader flank flattens from 40° to 10° or even 5° on the periphery of the fold.

Except for some minor dislocations, the main dome is free of faulting. There is one strike fault of small throw on the southwest flank. Middle Siwalik beds on the north side of this fracture which dip at 40° to the SSE are thrown against other slightly younger Middle Siwalik beds dipping 10° to the SSW. This fault is of no structural significance from the point of view of oil accumulation.

There are no gas or oil seepages on Joya Mair, and although Wadia suggested that it might well prove to be an oil structure, a test was not drilled here until wartime shortage and the diminishing production from the older fields resulted in an emergency program sanctioned and assisted by the supply department of the government of India.

The first test here was started in June, 1943, and in May, 1944, encountered a considerable flow of heavy oil at a depth of 6896 feet in Eocene nummulitic limestone. The oil produced flowed on test at a rate of about 9000 barrels daily, but so viscous and asphaltic was it that the Attock refinery at Rawalpindi could not process it without extensive modification. A second well, drilled in 1944 about 1100 feet south of the discovery well, found conditions in the limestone reservoir horizon less open, but eventually by deepening produced oil at about the same rate as No. 1. A third well, begun in 1945, about one-third of a mile from No. 1 and considerably further down dip, entered the limestone at the expected depth, but the horizons found to be oil-bearing in the first two wells here were barren. This well has been deepened to test pre-Eocene strata. It penetrated Carboniferous beds, and the latest development announced in January, 1947, by Attock Oil Company was that it had reached 8412 feet and was showing dark oil in the cores from this level. Casing has been cemented above this show for a test. If successful this will be the first Palaeozoic producer in India.



Joya Mair Dome fold in Punjab Province of India.

Appraisal Is Difficult

Until No. 3 has been completed and further wells drilled, the true productive capacity of the Joya Mair field cannot be appraised. Because of the poor quality of the oil and attendant refining difficulties, the amount of oil being withdrawn is too small in relation to the potential capacity to indicate very well the capacity of the reservoir. After considerable experimental work, a start has recently been made in refining small quantities of this oil and also producing asphalt.

Experience at Dhulian has shown the danger of estimating the productive capacity of a field in this area on the basis of the results obtained from one or two wells, and it is therefore intended to test the Joya Mair structure fully before making the large-scale capital expenditure that will be needed to handle the crude in volume. Results recently obtained from Balkassar (see below) may, however, accelerate the parallel development of Joya Mair.

Burham Oil Company is drilling a test well immediately north of the Joya Mair structure, and agreement has been reached between Burmah and Attock Oil for unit development of the concessions in the event oil is found in this test, which has reached a depth exceeding 7000 feet.

The newest oil field of the Punjab, discovered in 1946 at Balkassar, is about 12 miles from the Joya Mair field. The

test well was commenced in July, 1945, oil was struck in 1946 at a depth of 8200 feet in Eocene limestone. Initial tests showed a capacity of 350 barrels daily, but production has been limited through lack of storage and transportation facilities.

The structure at Balkassar, which is about halfway between Joya Mair and Jhatla, is a more marked anticline than Jhatla, but a less compressed anticline than Joya Mair. It lies in echelon with the latter fold, being separated by a comparatively shallow saddle. The relationship between Balkassar and Joya Mair resembles that between Dhulian and Khaur. In both cases the first-named fields lie on more open structures which are stratigraphically higher and in which the oil zones are consequently deeper.

The depth of the Eocene at Balkassar is 8137 feet, and the first well has been deepened to 8398 feet. Several acid treatments have been utilized in an effort to increase production from the compact limestone. A small quantity of water accompanies the oil. It contains only a small fraction of dissolved salts, and its origin is still obscure.

The potentialities of Balkassar can not yet be properly estimated. The oil is better quality than that of Joya Mair, although also asphaltic. Development here heads the current Attock drilling program, and several exploitation wells are planned for the immediate future. Subject to the probable success of these wells, are major alterations to the Rawalpindi refinery and a 35-mile pipe line linking Balkassar and Joya Mair with Rawalpindi. The route of this proposed line has not yet been decided.

Other Recent Tests

Although development of Balkassar is Attock's foremost current interest, the company is continuing its search in other areas.

Meyal lies to the north of Khaur and Dhulian in an area of increasingly complex geology near the Himalayan foothills. In this area the simple anticlines of the southern fields are replaced by complex overthrusts. An early test was drilled here by Burmah Oil Company, on a truncated anticlinal cusp, but the Eocene was not reached. Attock recently drilled two deep tests in this region, the second of which was abandoned in 1945 at 10,501 feet, making it the deepest well in Asia. The first Meyal well reached 8400 feet before being abandoned due to drilling difficulties and casing collapse. Neither test was geologically conclusive, and a third deep test will start soon in the same region.

Thirty miles west-northwest of Meyal occurs an area where there are closely similar geologic conditions. Here, on the Uchhri location a deep test was drilled to 8500 feet, before being abandoned in 1944 owing to drilling difficulties. Results were inconclusive.

In the Bokra area in the Kala Chitta foothills, the folding is very compressed, and the rocks generally have a steep northward dip. There is a regional stratigraphic rise, which eventually brings the Eocene to the surface with numerous resultant oil shows. A number of shallow tests were drilled by the Attock and the Indolex, at Golra, Chharat, Khairi Murat and Ganda Kas, but the Attock tests at Bokra were the only deep holes, reaching 4000 and 6000 feet respectively. The second of these tests, which were both negative, was abandoned in 1946.

The only other recent test drilled was that at Jhatla, 10 miles north of Gabhir, where Whitehall Petroleum Corporation drilled to the Eocene at 5925 feet in 1923-1925. Small oil shows were found, and Attock drilled on a nearby site in 1939-40 to test thoroughly the Eocene. The well was carried down to 7957 feet into Permian and Carboniferous formations, but with negligible oil shows.

Burmah Oil Company also has carried out extensive exploration work in Northwest India, particularly in Baluchistan and Sind, where there has been some unsuccessful drilling down to the Jurassic. In 1938 this company began a geophysical examination of Northwest India. This had to be suspended during the war, but the gravity survey had reached such an advanced stage that it has now been possible to proceed to a seismic survey. Indian Oil Concessions Ltd., also carried out geophysical work in one of the Punjab states before the war, but this company did not attempt any test drilling, and has relinquished its concessions.

Attock Production

The accompanying table summarizes Attock's production and shows the serious decline that has taken place through the rapid exhaustion of the Dhulian field. The limitation of the vertical producing area of this field and the necessity for producing the maximum amount of oil during the war has resulted in a progressive curtailment of pressure and production.

1937	284,000 barrels
1938	612,000 barrels
1939	757,744 barrels
1940	767,302 barrels
1941	885,780 barrels
1942	780,721 barrels
1943	594,845 barrels
1944	410,864 barrels
1945	324,870 barrels
1946	295,293 barrels

ACKNOWLEDGMENT

Thanks are due Attock Oil Company Ltd. for some of the information in this article.

Considerable Increase for Italian Gas Production Is Seen for Future

The Societe Italo-Americano Metano (SIAM) has been formed with headquarters in Rome to develop the natural gas resources available in Italy. J. D. Creveling and D. Kotlenko, two American experts, have worked out a plan to connect Milan with the northern gas fields.

This project would involve an expenditure in excess of $2 million and would call for the construction of a 10-inch line from Rovigo to Milan. It is believed that with further drilling it may be possible to produce 15 million cubic feet of methane daily from the northern gas fields.

It is estimated the Italian gas reserves cover an area of some 17,760 square miles, of which only about 386 square miles have to date been exploited by shallow wells. In the north, the gas production is centered around Rovigo, Rivanazzano, Salsomaggiore, Podenzano, Pietramala and Poretta. The construction of pipe lines connecting these areas with the major towns of Ferrara, Bologna, Padova and Rovigo has already commenced. An older pipe line is the one completed in 1940 between Pietramala and Florence, a distance of 33 miles, which has a daily capacity of 353,000 cubic feet.

In central Italy, gas production is being developed in the Castel dell'Alpi, Monte Busca, Castagno and Viamaggio zones. In the south, and in Sicily, the gas areas are Chianzano, Rivisondoli, Calabritto, Sant'Angelo, Tramutola, Casabona, Gioitto, Cerami and Monte La Guardia.

Present Italian gas output does not exceed 90 million cubic feet annually, but this figure is likely to be considerably increased in the near future.

Bolivian Line Delayed

Heavy rains for the past two months have delayed work on the crude oil pipe line from the Camiri field to Tin Tin in Bolivia. The line is being constructed by Williams Brothers Corporation.

Preliminary supplies for the pump stations have been received and the first shipment of pipe is expected shortly. Actual laying of the pipe is expected to commence within a few weeks.

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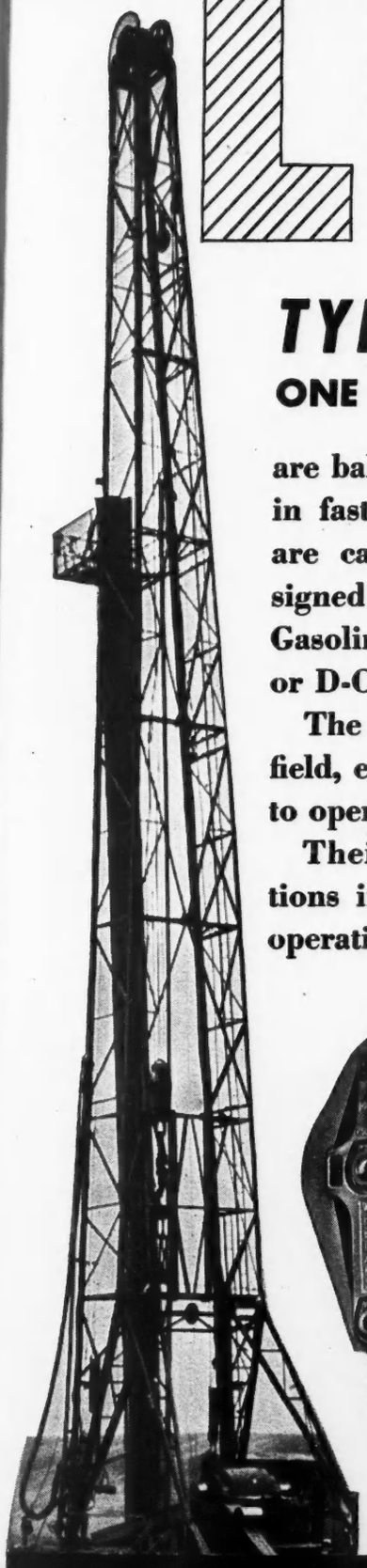

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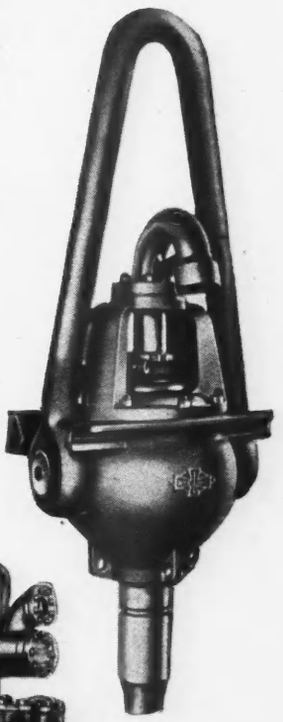

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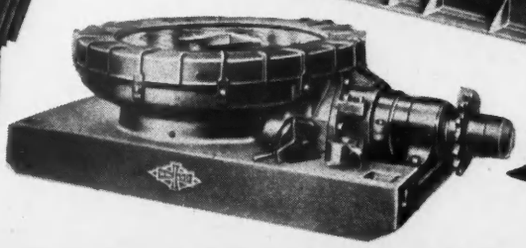

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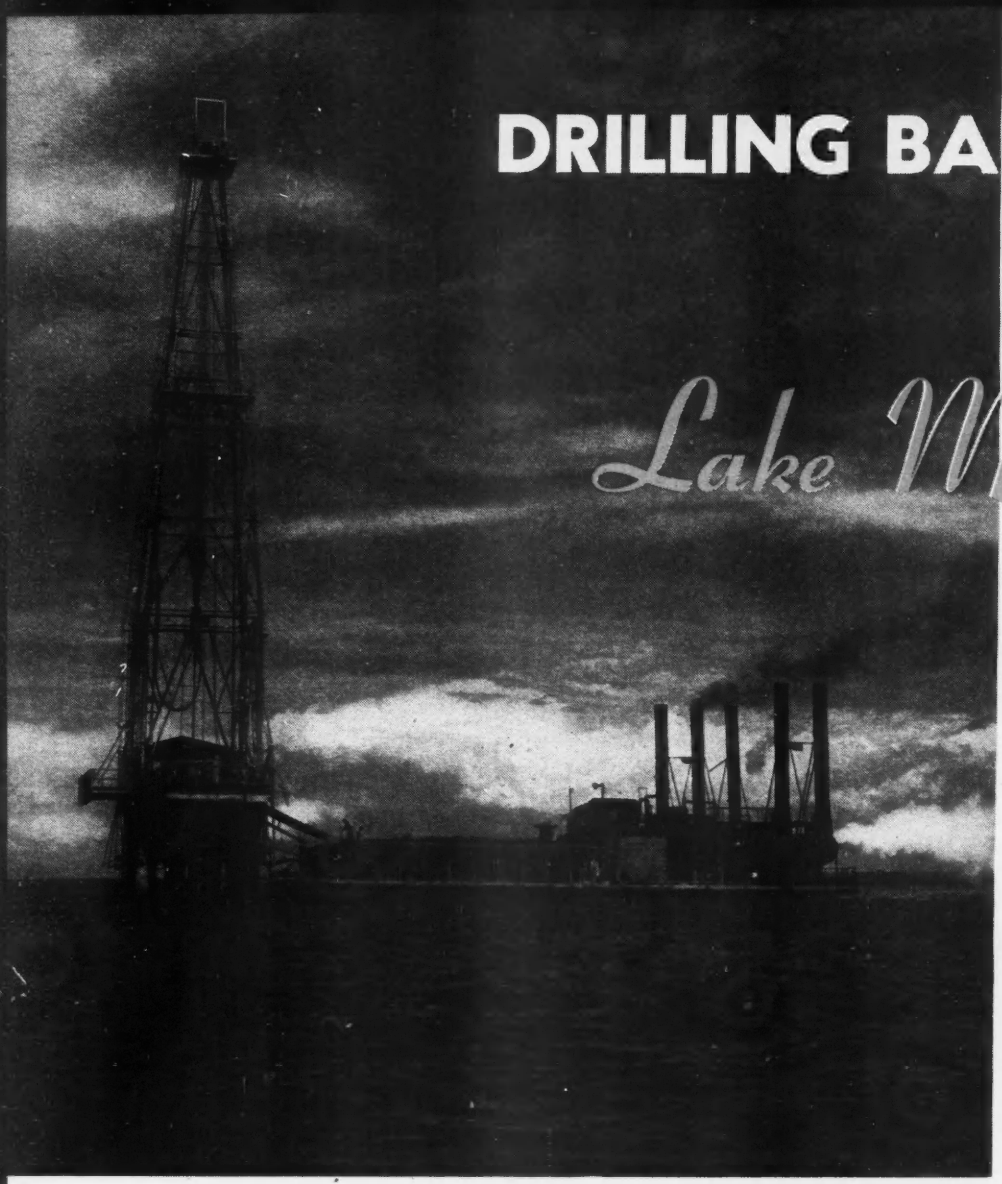
DRILLING BARGES FOR Lake Maracaibo



View of new Lake Maracaibo barge in operation 15 miles offshore. The all-welded drilling derrick is light, portable and easy to hoist for use in other locations.

TO FACILITATE drilling of wells in Lake Maracaibo at farther distances from the shore (15 to 25 miles), and at greater water depths (60 to 90 feet), Creole Petroleum Corporation has built four large size drilling barges.

These new barges were built locally by Venezuelan welders, specially trained by Creole for this purpose. The old barges, used for deep water drilling, thus are available for drilling locations closer to the lake shore.

In addition to the improvement attained in drilling barges, Creole also has designed and built a new type of all-welded drilling derrick, which is lighter and portable in that it can easily be hoisted in two units for use in succeeding locations. A great saving in the size of heavy caissons necessary for derrick foundations on the water may be obtained by the use of these lighter steel derricks.

The increased weight of the new barges will reduce down-time caused by rough lake conditions, a pertinent factor in marine operations. This factor has increased in importance as drilling has progressed farther and farther from shore and water depths have increased. Rigs operating more than ten miles from shore in water 60 feet deep are not uncommon at present.

The drilling barges, and one dumb barge, were built in Creole's machine shop at La Salina, between October, 1944, and November, 1945. The dumb barge was fabricated first in order that the workmen might gain enough experience to build the new larger ones.

Under the direction of an American foreman, Venezuelan workmen were used entirely. Beginning with one experienced and nine inexperienced welders, a six-week welders course was instituted. The original crew then built the small dumb barge. By the use of a school and job training courses, the crew was built up to 30 men. Arc welding was used almost entirely in the construction of the drilling barges.

The four drilling barges are identical except for minor alterations. Prefabrication assembly methods were used insofar as possible with available equipment. All the interior section such as bulkheads, trusses, frames, tanks, etc., were preassembled.

Overall dimensions are: 110 feet long, 60 feet wide, and 18 feet high. Overall displacement figures are: 155 tons without and approximately 300 tons with stationary equipment. Stationary equipment includes boilers, mud pumps, water pumps, fuel oil pumps, pipe arrange-

Portion of mud storage tanks and funnel used for conditioning the mud.

Photo at top of page shows mud pumps and outlets to mud storage tanks in special barges built for drilling in Lake Maracaibo, Venezuela.

Lower photo shows boiler room and feed water pumps on these Creole Petroleum Corporation barges.

ment, swab reel and engine, etc. Total load capacity is estimated at 1500 tons.

The barges have three decks, main deck, pipe deck, and platform deck. The main deck, eight feet above the bottom of the barge, extends its length and breadth. The pipe deck is 6 feet, 8 inches above the main deck, extends aft from the forward end of the barge a distance of 60 feet, and is 50 feet wide. Reserving 10 feet for free working space, approximately 2400 square feet of pipe storage area remains. Normal pipe storage consists of the total amount of casing of the desired size. After this size has been run, the next required is towed out on a separate barge and stored on the pipe deck. The highest deck, the platform deck, begins at the aft end of the pipe deck, is raised 3 feet 2 inches above it, and extends aft a distance of 28 feet. Its width is the same as that of the pipe deck, 50 feet. Swabbing equipment is mounted on this deck, which also includes an office. The remaining space is used for miscellaneous storage.

Space between bottom of barge and main deck is, for the most part, divided into water tight compartments used in maintaining the trim of the barge. Remaining space contains the fuel oil tank, four mud storage tanks and the cellar in which are mounted the mud pumps.

The mud system, limiting factor in drilling depths for which the barges may be used, is composed of the mud trough, settling basin, suction pit, storage tanks, pumps and necessary piping. Returns from the well, conducted by 10-inch suction hose flow into the mud trough. Alternate procedures may be used as the mud enters. It may pass directly into the trough or may pass through a shale shaker and then into another trough. The mud trough begins on the port side at the forward end (end which is lashed to the derrick foundation) goes across the barge approximately 35 feet, enters the settling basin, and then aft approximately 33 feet where it empties into the suction pit. Since the settling basin is volumetrically larger than the trough proper, the rate of flow through it is less, thus allowing time for foreign material to settle out. Still further settling is accomplished in the suction pit which has greater volume than the trough. The capacity of the above described portion of the mud system is 400 barrels. Structurally, it is designed to support the weight of this volume of the heaviest mud used. In addition to this system there are four mud tanks, two on the port and two on the starboard side, which are used as idle storage. Their total capacity is 1500 barrels. Provisions for agitating are incorporated so that mud with the desired characteristics can be made up in them and then pumped into the system. These tanks are particularly handy in the event of lost returns in the hole. Pertinent dimensions are as follows:

	Length ft.	Width ft.	Depth ft.
Mud trough, portion forward across	35	3½	3½
Mud trough, starboard side portion extending aft	33	3½	2½
Mud trough, settling basin	13	8½	7½
Suction Pit	9	20	7¼

An amidship section, 24 x 30 feet of the main deck near the suction pit was lowered 6 feet to form a cellar in which to mount the two mud pumps. By lowering the pumps below the discharge of the suction pit, flooded suction on the mud pumps was provided. Mud pumps on all barges are not identical, but a typical setup includes one 7¾ x 20-inch duplex carrying a steam pressure of 200 to 250 pounds and a working pressure of 800 psi. and one 7 x 20-inch triplex carrying a steam pressure of 200-250 pounds and a working pressure of 1100 psi.

On the forward port side of the main deck a space 40 x 12 feet serves as mud dry storage, being sheltered by the pipe deck above. Normal storage is around 600 sacks of mud weighting material, 100 pounds each.

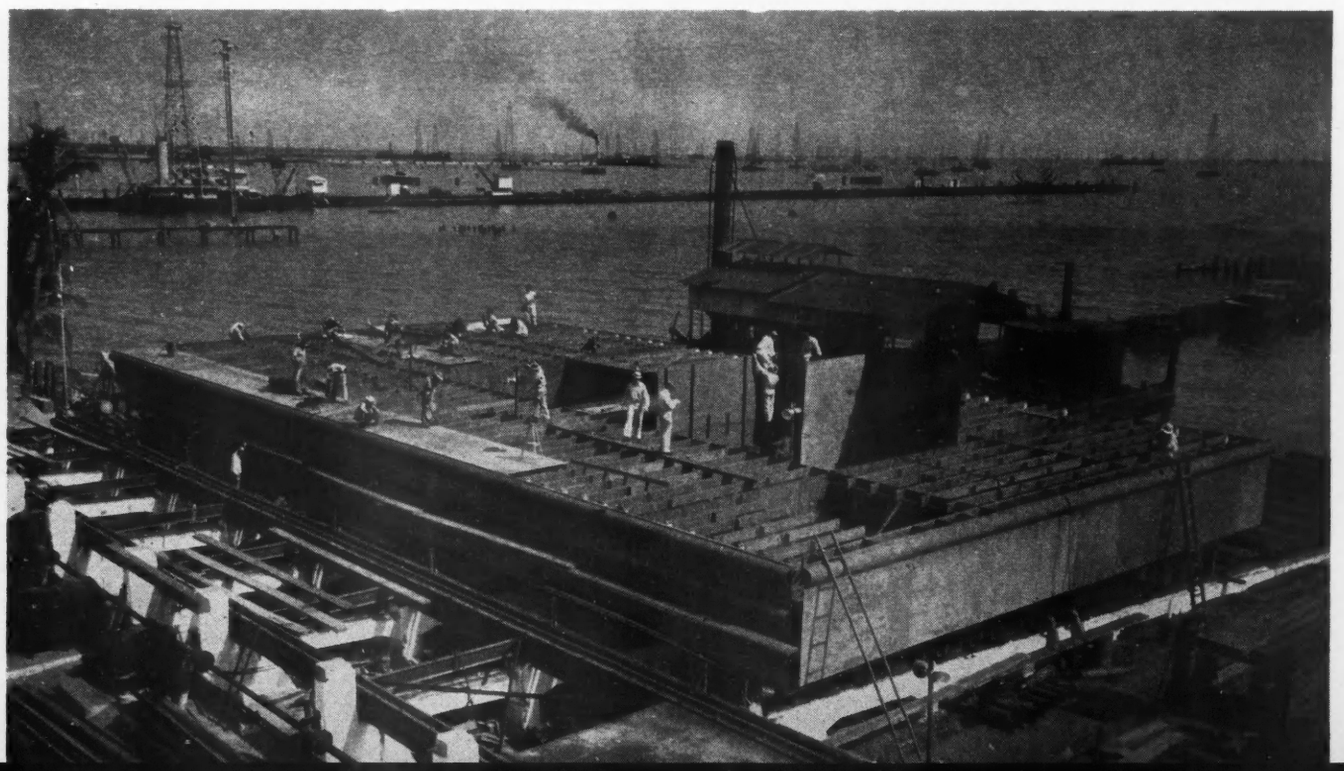
Steam Power System

Steam pressure is used throughout, both on the barge and the rig itself. Five 150-hp., 350-psi. locomotive type boilers mounted on the main deck at the aft end supply steam power for the entire operation. The boilers are fired with a medium heavy crude oil.

Fuel oil storage is provided by a 700-barrel tank mounted amidship at the forward end of the barge (as far as possible away from the boilers). This storage represents one week's supply of fuel. The top of the tank is slightly below the main deck. This tank is 21 feet long, 16 feet wide, and 12 feet deep. There is a 2-foot clearance between the walls of the tank and the bulkheads of the compartment which surrounds it. This allows ample space for repairing leaks that may develop.

All material used in construction of the barges was imported from the United States. Three-eighths-inch plating was used on the main deck, bottom, and the sides; 3/16-inch on the pipe and platform decks; 5/16-inch on both transverse and thwartship bulkheads. Longitudinal rigidity was provided by four trusses made up of 9-inch 15-pound cords with 4 x 4 x 5/16-inch diagonals. Longitudinal bulkheads were welded to these trusses. Traverse rigidity was provided by frames which run athwartship each 2 feet, 3 inches.

Large drilling barge under construction by Creole Petroleum Corporation for deep water drilling in Lake Maracaibo, Western Venezuela.



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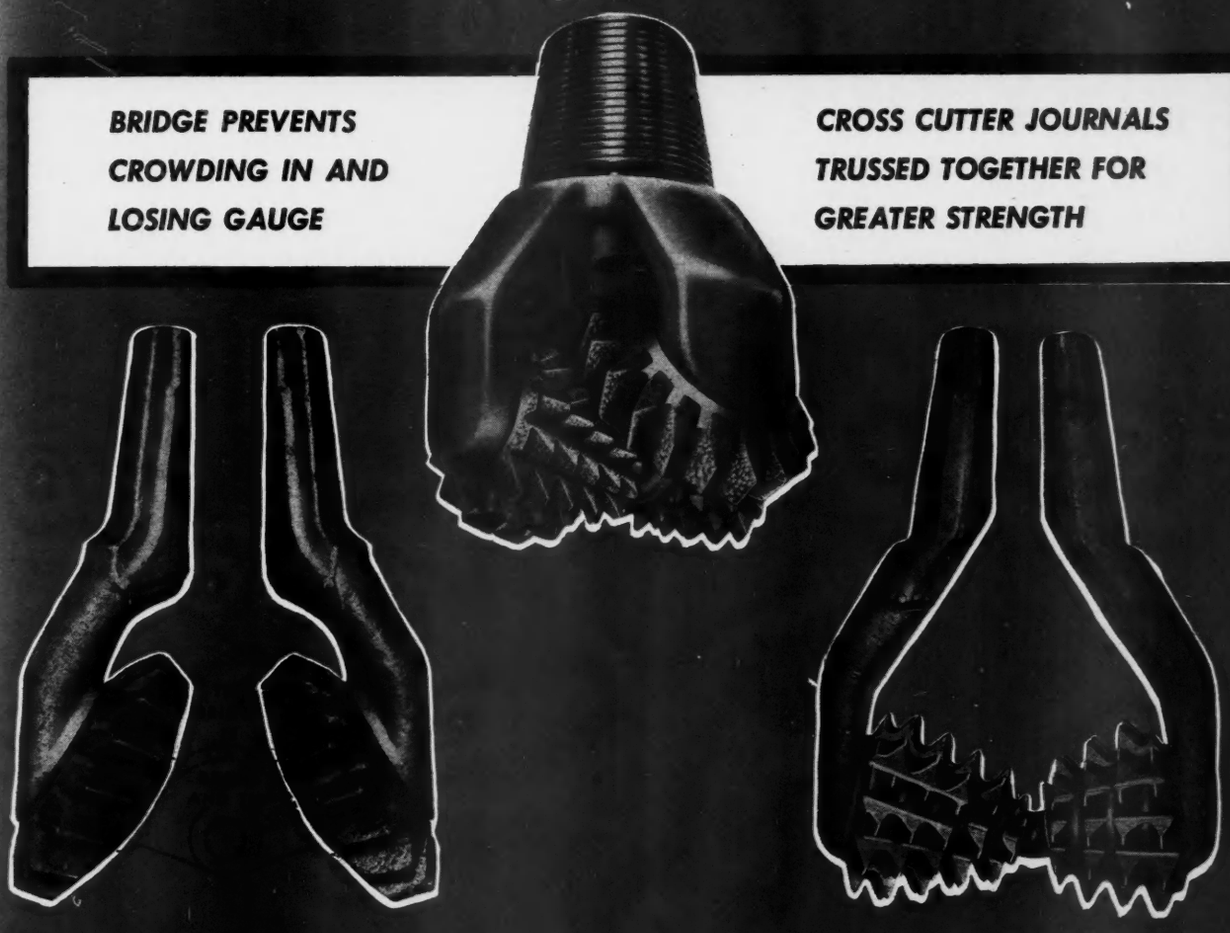

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Sun's Nova Scotia Test Is Being Watched Closely

Sun Oil Company's Smith 1-A, important wildcat operation in Nova Scotia, has reached a depth of 10,200 feet and is being watched very closely. No showings of oil or gas have been reported. The well, which has been drilling for two years, is five miles south of the town of Amherst, and 50 miles east of the Stony Creek oil field on a structure known locally as the Minudie anticline.

The well is the only one in Nova Scotia outside the Stony Creek field thought to be favorably located for a test of the Albert series of the Mississippian. In this area there have been found extremely thick beds in the Pennsylvanian and Permian which have made the Mississippian too deep in most places to be reached by ordinary drilling methods. A well completed last year off Prince Edward Island by Socony Vacuum and Cities Service had drilled to 14,696 feet without reaching the Mississippian, finally stopping in salt.

The Sun well is in the Albert series of the Mississippian as far as can be determined. The upper members of this age outcrop on the crest of the Minudie anticline, a structure worked out entirely by surface geology. It is understood that a gravity survey has since been run over the area without changing the interpretation made on the basis of surface geology.

Operations in Antarctica Offer Many Difficulties

The great continent of Antarctica should contain conditions for the production of petroleum, but the problems of how to get to the areas which might yield production, and how to get the natural resources out of the ground make it a great economic risk, Dr. F. Alton Wade, professor of geology at Miami University, Oxford, Ohio, told the Tulsa Chapter of Nomads recently.

The geologist, who has made two expeditions to Antarctica, said that so far geological crews have been unable to penetrate the vast areas for closer observation, due to ice, snow and adverse weather conditions.

He emphasized the point by stating that on the last trip to the continent, the 1939-41 expedition, geologists were on the continent for more than half a year without even examining a rock.

Dr. Wade explained however, that mountain peaks were visible from the air, and on several occasions sledding parties were able to transverse comparatively close to these granite mountains thrusting approximately 500 feet above the ice. Their elevation at the summit was estimated at approximately 3700 feet.

Gold Coast
OIL PROSPECTS

By E. N. TIRATSOO, Staff Writer

OIL exploration activity is reported in the Gold Coast, the tropical African British colony on the Gulf of Guinea. The Gold Coast Petroleum Company, Ltd., is undertaking survey work over its concessions in collaboration with two Shell exploration companies. Comprehensive surveys must be completed by August, 1949, in order to take up the drilling option on the concessions.

Previously, sporadic attempts have been made to discover oil and gas in this region, about a dozen exploratory wells having been drilled during the last 40 years. Most of these were drilled at random, with no regard to local structure, and since for the most part no geological logs were kept, these unsuccessful tests cannot be considered as providing any evidence one way or another on Gold Coast oil prospects. Traces of oil and gas were found in most of these early wells, but no commercial shows were discovered, although gas and oil seepages are not uncommon.

Much of the Gold Coast territory is made up of Archaean rocks. These are locally divided into two classes—those which are older than the main period of granitic intrusion (Archaean gneisses and Birrimian phyllites and schists); and those which are younger than the granites (Tarkwaian, Akwapimian and Buem, all of which are probably pre-Cambrian in age). There is no possibility of oil in the areas occupied by these rocks.

A belt of sedimentary deposits, possibly containing oil accumulations, occurs from the sea coast approximately 20 miles inland. These rocks comprise Devonian, Carboniferous, Cretaceous and Tertiary strata. Of these, the Cretaceous is by far the most important, since it consists of more than 4000 feet of alternating sandy and clayey sediments, with occasional limestone bands.

It is interesting to note that most of the interior of the Gold Coast territory is made up of extensive sedimentary deposits. These comprise the Voltaian system of rocks, whose maximum thickness is about 2600 feet. These Voltaian sediments form part of the horizontal sandstone series exposed in the Ivory Coast and French Guinea, and are probably of Ordovician or Devonian age, although diagnostic fossils have not been found. They were deposited in a gentle basin and are flat or slightly inclined except at the eastern margin where folds occur. Although comprising many suitable sandy reservoir horizons, it is doubtful whether the Voltaian sediments are thick enough to have engendered and preserved commercial oil accumulations.

Geological Congress Set For Next Year in London

The eighteenth session of the International Geological Congress, originally planned for 1940, will be held in London, August 25-September 1, 1948. Full details can be obtained from the general secretary of the Congress at Geological Survey and Museum, Exhibition Road, London, S.W., 7, England.

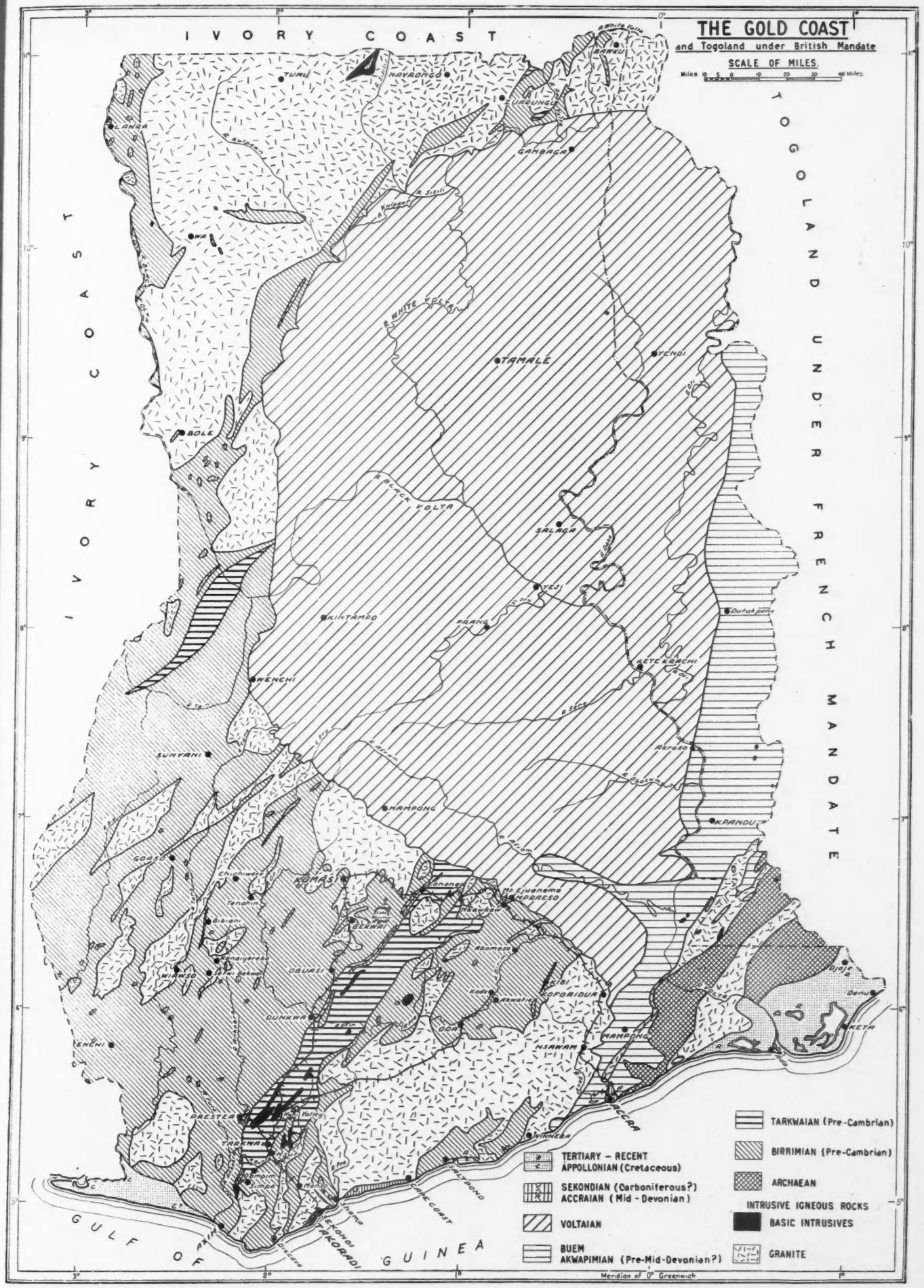
Sir Thomas Holland will be chairman of the session and the organizing committee includes a number of British oil men. Viscount Bearsted, chairman, Shell Trading and Transport, and R. I. Watson, chairman, Burmah Oil Company, are honorary members of the committee. Members include the president of the Institute of Petroleum, Professors V. C. Illing and W. R. Jones of the Imperial College, Dr. G. M. Lees, chief geologist, Anglo-Iranian Oil Company, T. Dewhurst, geological adviser to the Burmah Oil Company, and P. Evans, chief geologist, Burmah Oil Company.

Discussions will include the divisions of the geology of petroleum and the geological results of applied geophysics, of particular interest to oil men.

American Company Seeking Concession in Guatemala

Dr. Barnum Brown, specialist in petroleum geology, has indicated in recent statements his belief that there were rich petroleum deposits in Guatemala, according to information received by the Department of Commerce.

Dr. Brown is conducting surface geological studies of several areas in Guatemala on behalf of a group of Americans who have applied for a petroleum concession in the country. It is understood that members of the group will arrive in Guatemala soon to commence negotiations for the concession.


THE GOLD COAST
and Togoland under British Mandate
SCALE OF MILES.
IVORY COAST
IVORY COAST
TOGOLAND UNDER FRENCH MANDATE
GULF OF GUINEA
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CAPE COAST
KOFORIDUA
HOHOE
KETA
TARKWAIAN (Pre-Cambrian)
BIRRIMIAN (Pre-Cambrian)
ARCHAEAN
INTRUSIVE IGNEOUS ROCKS
BASIC INTRUSIVES
GRANITE
TERTIARY – RECENT
APPOLLONIAN (Cretaceous)
SEKONDIAN (Carboniferous?)
ACCRAIAN (Mid - Devonian)
VOLTAIAN
BUEM
AKWAPIMIAN (Pre-Mid-Devonian?)
Meridian of 0° Greenwich

Wartime Obstacles Overcome

British Well Shooting Problems

By J. F. WATERS
Anglo-Iranian Oil Company, Ltd.

COMMERCIAL oil production in England is comparatively new and was developed during the war. English engineers were handicapped in their operations because of materials shortages and, in the light of techniques used in shooting operations in American oil fields, were compelled to work out some fundamental problems in their own way. The following article describes the problems and the way they were overcome at one of the new English producers drilled by the d'Arcy Exploration Company, Ltd., which has pioneered oil exploration in England for many years. The well is in the Nottinghamshire field and produces from a formation known as the Rough Rock at an average depth of 2000 feet. At the conclusion of the article are published the comments of an American well-shooting authority, not intended as a criticism of the English technique, but in order that English operators may become acquainted with American shooting technique.

The paper was presented before the Institute of Petroleum, London, England and publication is through permission of the Institute.

MUCH has been published on both the theory and practice of oil-well shooting for increased production and the present paper is confined to some of the problems which have confronted the D'Arcy Exploration Company, Ltd., in well-shooting operations in England. The principal producing sandstone, the Rough Rock, at the top of the Millstone grit, is 50 to 80 feet in thickness and lies at an average depth of 2000 feet. It varies in grade from a fine sandstone to a grit; its porosity varies from 0 to 25 percent and its average permeability is 10 millidarcies, though there are streaks with a permeability up to 300-400 millidarcies. This was the sand normally shot, but, in addition, other sands were also shot in a number of wells.

Until mid-1943 the explosive charge was placed near the bottom of the Rough Rock, in order (a) to keep it as far as possible from the casing-shoe, and (b) to form a fissure system extending upwards and outwards from the shot, thus allowing gravity to assist drainage. Latterly it was placed opposite what were believed to be the more permeable sections, provided these were not too near the casing-shoe.

In the early years of the war the technique employed consisted, briefly, in cleaning out with oil circulation both before and after the shot. The tamping consisted of a column of gravel, amounting to some 60-80 linear feet per 100 pounds of explosive. The oil level was bailed down as low as practicable before the shot in order to reduce the back pressure on the formation and thus allow the immediate rush of oil into the hole following the shot to help to bring the debris of the resultant fissures into the well, whence it could be cleaned out.

The explosive used has been exclusively blasting gelatin, lowered into the hole in thin, galvanized-iron containers, and dumped by means of a detaching hook. To assist propagation of the detonation, tetryl boosting pellets have been used, these being placed in the nose and tail of each container.

Firing Methods

The methods of firing the charge have undergone some changes. The first shot was fired from the surface by means of an electric cable lowered down the hole on a sand-line. But in the next attempted shot, the electric cable was broken during the process of feeding in the gravel tamping, and this method was abandoned in favor of the time-bomb.

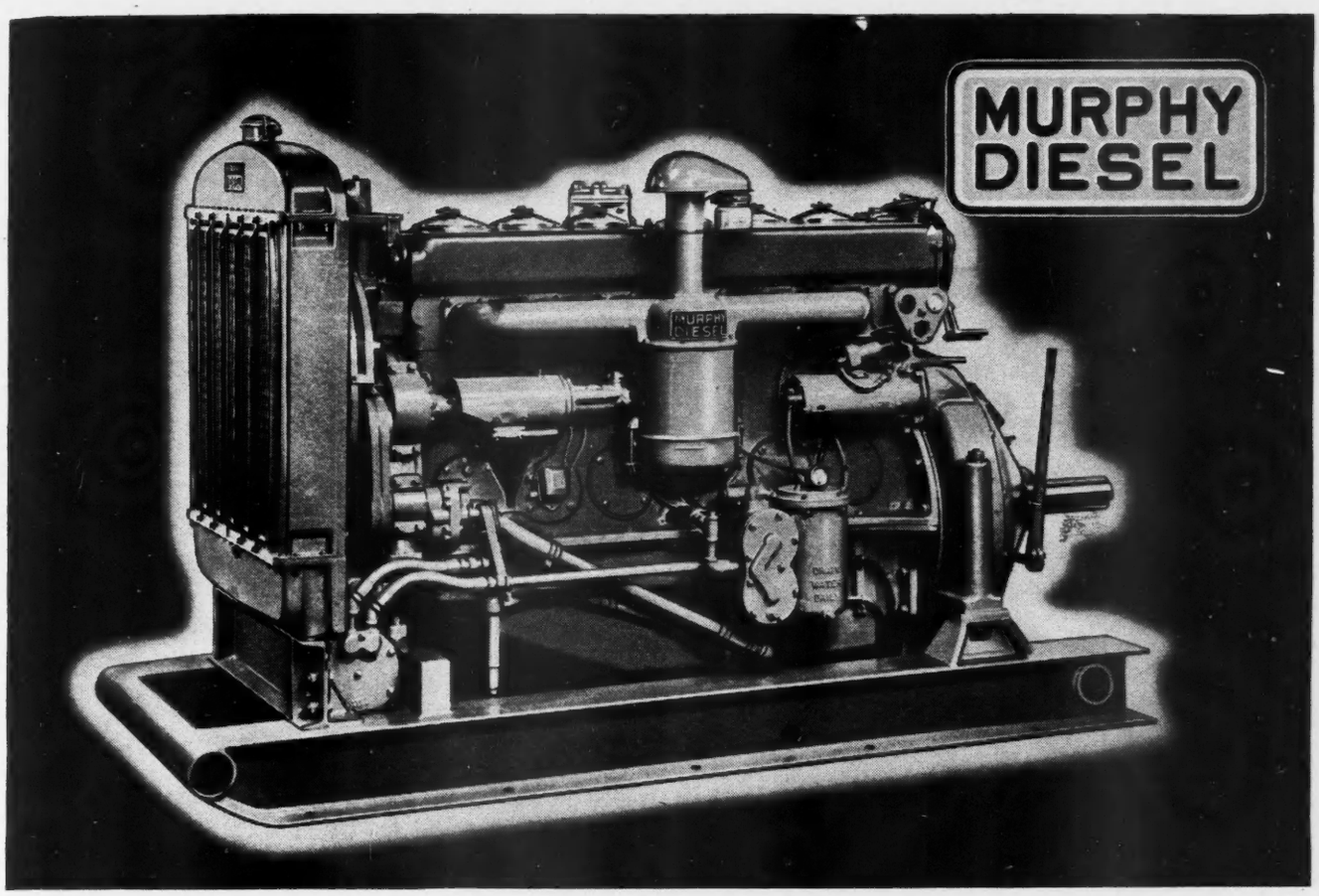
The time-bomb used in the earlier shots consisted essentially of a cylindrical wooden mechanism case, about seven inches long and 2½ inches in diameter, a small tinned canister to contain a priming cartridge, and a cast-iron, pressure-tight bomb-case in which the assembled bomb was lowered into the well. The firing mechanism, which was duplicated as a precaution against failure, consisted of an ordinary pocket-watch inserted in the top compartment of the mechanism case, and a No. 8 electric torch battery housed in a suitable recess in the side of the case. The minute hand of the watch was removed and the glass replaced by celluloid through which a small contact pin was inserted and cemented. Two electric detonators in parallel were connected to a pair of leads from the base of the mechanism case, and the device was wired up in such a way that the circuit, consisting of the watch, the battery, and the detonators, was completed by the hour hand coming up against the contact pin at the expiration of the required delay.

It was found by experience that, in testing the bomb circuits by bringing the watch-hand against the pin, the watch-hand was liable to become damaged, with the possibility either of failure to fire or of premature firing when the bomb was in actual use. The rigid pin was, therefore, replaced by a small swept spring, which served as an electrical contact, while allowing the hand to brush over it without risk of damage.

The assembly of the bomb was completed by burying the detonators in the top of a priming cartridge inserted in the canister, which was then fitted over the lower end of the mechanism case. The bomb was then placed in the pressure-tight case ready for lowering into the well.

In 1943 it was decided to carry out some experimental shooting on wells which had been on steady production for some time. For this purpose wells of good productive capacity were selected. The time-bomb used was a clockwork type for percussion detonators. The clockwork mechanism releases a set of hammers which are forced down, and thus fire caps to which the detonators are attached. Apart from this change, however, the technique adopted was identical with that previously employed.

Using a light drilling outfit, the pump capacity was such that, with oil in cir-



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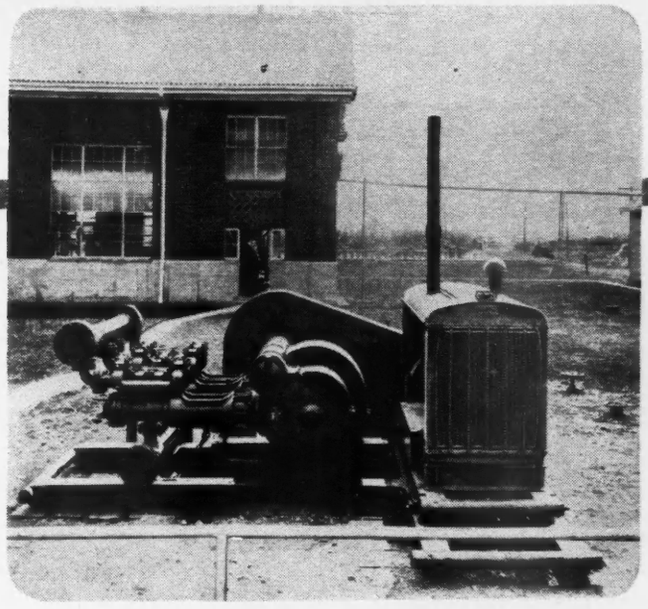

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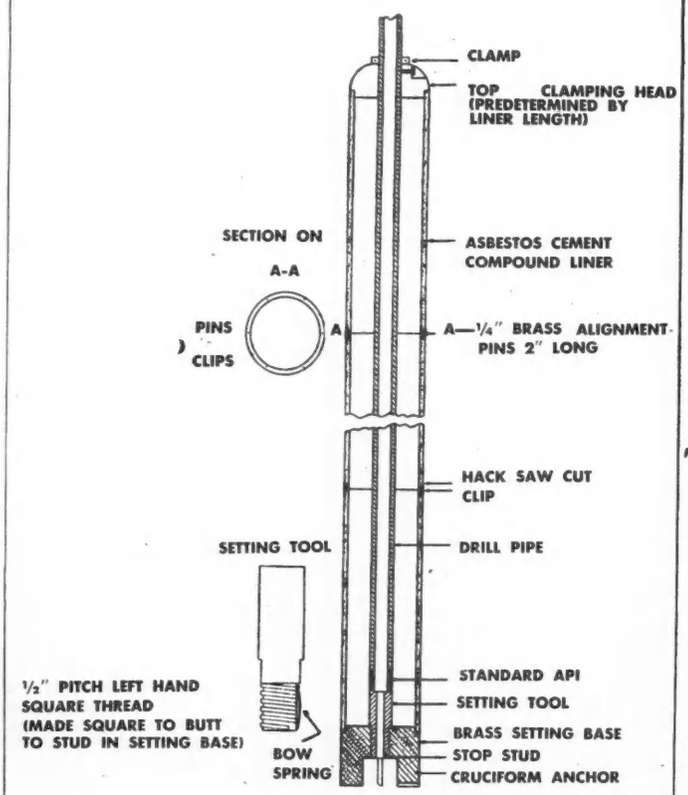

FIGURE 1
Asbestos-cement liner, showing method of making up and lowering into position in the hole.

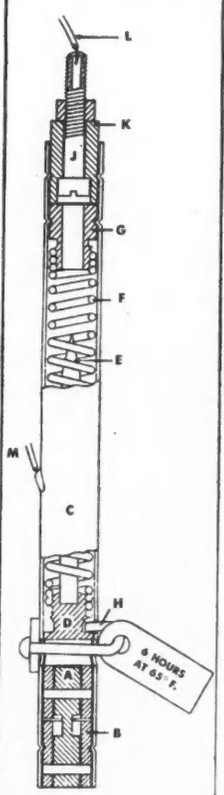

FIGURE 2
Details of "L-Delay," diagrammatic.

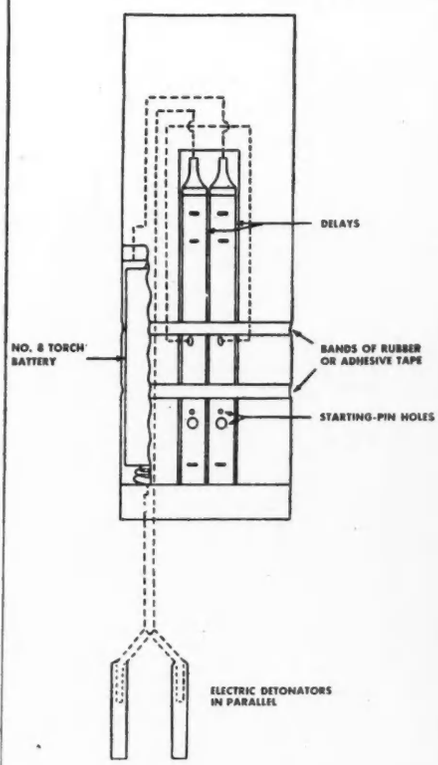

FIGURE 3
"L-Delay" bomb firing circuit, diagrammatic.

culation, cleaning out the gravel was much slower than with the heavy outfits used in drilling the well. As a result of production, the condition of the hole was often such that it caved badly, especially on bailing down. Even where it was found possible eventually to clear the hole to shooting depth, there was always the danger of cavings falling in during the running in of the containers, thus isolating part of the charge, or between running the top container and placing the time-bomb.

An attempt to overcome this difficulty was finally made by circulating down an asbestos-cement drillable liner. The liner, which was strong enough to hold back the cavings, but which would be shattered by the explosion, and therefore easy to clean out was made up of 10- and 13-foot lengths, according to diameter. The liner was lowered on flush-joint drill pipe, lengths being added at surface as the drill pipe was lowered down the hole. The method of making up the liner and placing it in position in the hole is shown in Figure 1. The liner rested on a shoulder on the upper face of a brass setting base. Rotation of this base during backing-off was prevented by a specially designed cruciform anchor. The setting base was drilled out and provided with a ½-inch pitch left-handed square thread, into which was screwed the setting tool. The latter is illustrated as an inset to Figure 1. The square thread was a slack fit, spinning off being prevented by a bow spring, fitted into the setting tool, bearing against the thread of the setting base. Over-tightening was prevented by a stop stud, as shown. The setting tool was screwed on to the bottom end of the drill pipe.

The lengths of liner were joined by means of two diametrically opposite strips of iron about four inches long, bent to form clips, set flush with the outside of the liner, and screwed into it on either side of the joint. The asbestos-cement could be readily drilled and tapped for this purpose. Rigidity of the column was assisted by a number of ¼-inch brass alignment pins spaced around the section of each length of liner. At the top of the liner a clamp was bolted to the drill pipe to centralize it and help maintain rigidity during lowering. After circulating to bottom, the drill pipe and setting tool were backed off, leaving the setting base in position. The top clamp came up attached to the drill pipe.

Although the asbestos-cement liner proved successful in the shooting of a few wells showing an abnormal tendency to caving, the difficulty of aligning it in the hole, resulting in trouble in the running of the containers, led to its abandonment.

As too much time was spent after each shot in cleaning out the gravel tamping, the use of gravel was abandoned in favor of crushed gypsum, of which supplies were fortunately available locally. This modification resulted in a marked improvement in the time of cleaning out.

The shortage of watches and other suitable types of clockwork mechanism resulting from wartime restrictions became acute. Attention was therefore directed to the possibility of designing a time-bomb independent of clockwork mechanisms. Through the good offices of the Petroleum Division of the Ministry of Fuel and Power, contact was made with a department of the Ministry of Supply, with whom the whole problem was discussed, and through whom a device was eventually obtained which will now be described in detail.

The principle employed depends on the gradual elongation to the point of fracture of a lead-alloy element under the tension of a strong spring. When fracture takes place, a striker is released which closes an electric circuit. Details of construction of the device, known as the "L-delay," are shown in part section in Figure 2.

One end of the metal element, A, which is about ¾ inch long and accurately turned down at its center as

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which pushes junk or debris down the hole ahead of the Retainer, and greatly minimizes the hazard of premature tripping of the Retainer by the fouling of the slips.

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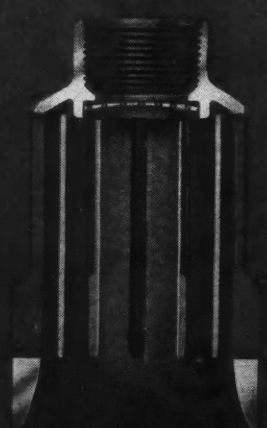
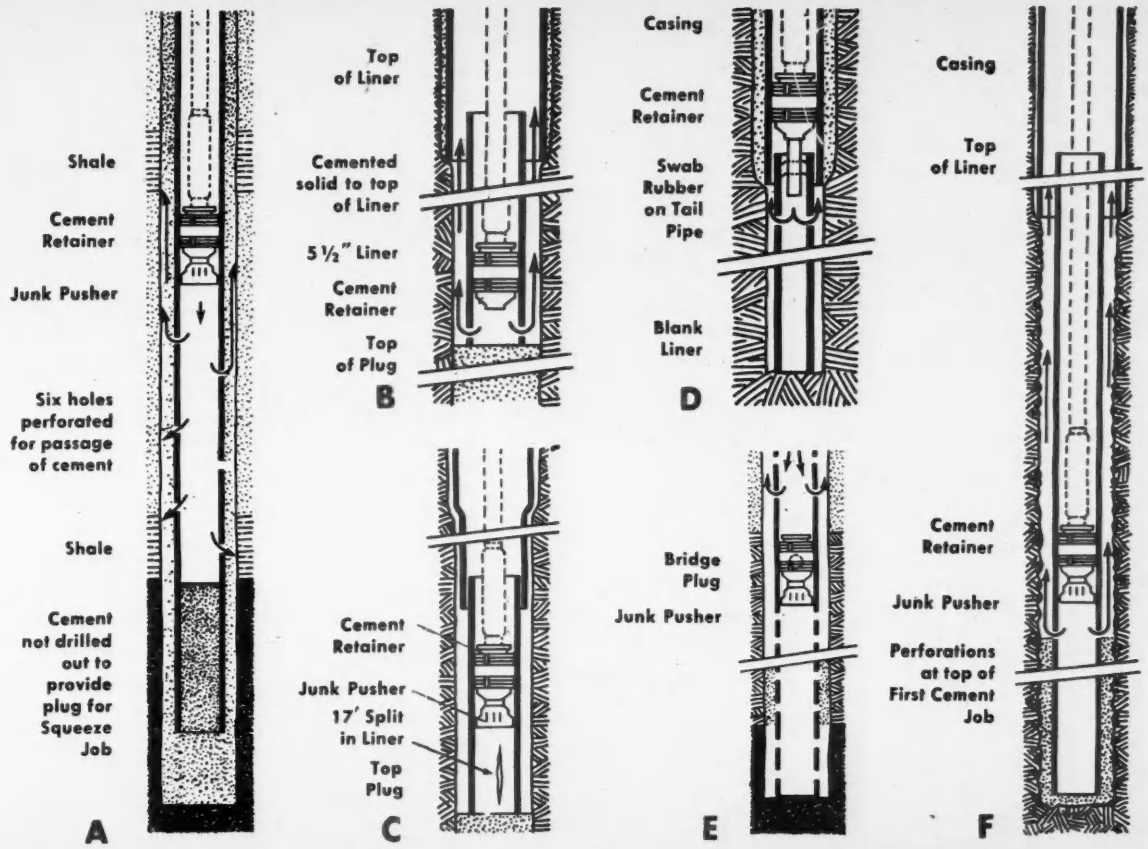
Baker MAGNESIUM ALLOY Type Cement Retainers are readily drilled up by using drill pipe, tubing, or cable tools, since all large parts are made of magnesium except the nitricastiron slips which are easily broken up. Magnesium Retainers have ample strength to withstand any pressure which can be imposed safely upon the casing or liner. Although Baker MAGNESIUM ALLOY Type Cement Retainers are satisfactory for *temporary* bridge plugs, they may be affected by well fluids, and the CAST IRON Type is recommended for *permanent* bridge plug installations.



The Baker Junk Pusher has an outside diameter slightly smaller than the inside diameter of the casing in which the Retainer is run. All debris tends to collect in the Junk Pusher. Slots permit passage of displaced fluid, but prevent passage of junk or debris which might foul the slips and result in premature tripping of the Retainer. The internal Screen (held in place by friction) prevents debris from entering the body of the Retainer, and is blown out at the proper time by the Tripping Ball Seat.



Here are some interesting applications of the Baker Model "K" Cement Retainer:

A. To control a gas/oil ratio of 25,300 to 1, with a production of 95 bbls. of oil, this well was cemented, and later cement was drilled out to a point just above the shoe. Casing was perforated with 6 holes above this plug; retainer was set; 43 sacks of cement put into formation at final pressure of 3,400 psi. Well was then completed, making 656 bbls. of 29° A.P.I. oil with gas/oil ratio of 466 to 1.

B. To cement a liner (or casing) — the liner was run into this well on a Cement Retainer which was then used for placement of the cement around the liner from its bottom to where it extended into the water string.

C. To cement off hole in casing or liner — where a lap-welded liner split and well went to water 100 per cent. The hole was bridged to a point just *below* split and Cement Retainer set just *above* split. After putting away 22 sacks of cement at 1,650 psi, water was completely eliminated.

D. To cement through perforation in liner — and cement blank liner at its top. Cement Retainer was set in casing above liner and tail pipe (with swab rubber) extended into liner opposite perforation. Final pressure of 1,250 psi put away 75 sacks of cement—job completely successful.

E. To provide bridge plug — retainer was set at top of blank section of liner which had been cemented below, but showed water at top. Thereafter this well was successfully cemented by conventional method through perforations above blank pipe.

F. To complete an original cementing job where cement did not reach to top of blank liner (set opposite productive zone) to be gun-perforated. Perforations were made until top of cement was located; Cement Retainer was set above open perforations, and cement forced upward behind liner to a point above shoe of water string.

Contact the Baker man in your territory, who can make helpful suggestions — and solve your cementing problems.

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shown, to a diameter determined by the required timing, is held by a pin in a brass bushing, B, crimped into the lower end of metal tube, C, four inches long. The other end of the element is similarly secured into the brass striker head, D, to which is attached the striker pin, E, and one end of the tension spring, F. The other end of the spring, which is stretched during assembly, is attached to the anchor bushing, G, crimped into the outer tube C near its upper end. Until the device is required for use, a J-shaped starting-pin H, passing through holes in the outer tube, C, and in the striker head, D, takes the load of the spring, the short arm of the pin engaging with the striker head, as shown, and preventing any movement of the striker pin. At the upper end of the outer tube, C, an insulator bushing, K, crimped into the tube, holds the metal terminal bolt, J, to which a rubber-covered lead, L, is soldered. A grounding lead, M, is soldered to the outside of the outer tube.

On withdrawing the starting-pin, H, the load of the spring is transferred to the element, which starts to extend slowly but regularly until it breaks, allowing the striker to be forced up the tube and to be driven into the terminal bolt, thus providing a metallic path through the "delay" between the two leads M and L.

Safety Features

Safety in handling is amply provided for. In the course of manufacture, routine testing of a most scrutinizing nature is carried out. This is designed to maintain a check on the homogeneity of the element alloy, and to test the firing time and general reliability of the finished article, on the principle of extensive random selection. In addition the design incorporates the following safety features:

A. A small tab attached to the starting-pin indicates clearly the timing of the delay.

B. Inadvertent withdrawal of the starting-pin is prevented by a small spring-clip.

C. Should there be any fault either in the element itself or in the assembly of the device, it is impossible to pull out the starting-pin for, on withdrawing it a fraction of an inch, the short arm becomes disengaged from the striker head and the long arm becomes trapped by the striker head starting to move under the tension of the spring, a small head at the end of the long arm preventing its withdrawal through the hole in the outer tube.

Provided the device is handled with the element end downwards, it can be dropped on to a hard surface from a height of several feet after withdrawal of the starting-pin without risk of premature fracturing. If dropped with the element uppermost, however, the mass of the striker assembly transmits to the element, on impact, a tensile shock which is liable to cause instant or premature fracturing.

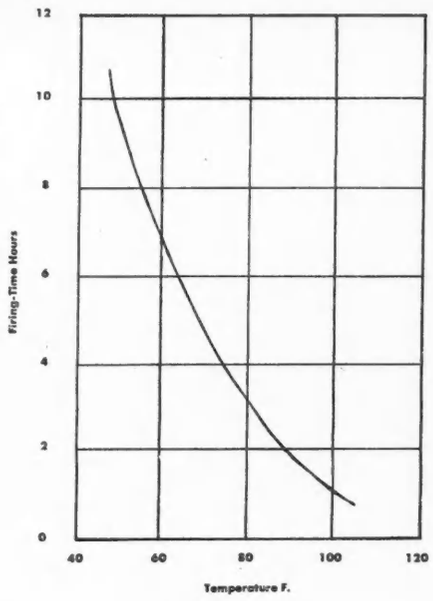


FIGURE 4
Decrease of firing time with increase of temperature.

The device has been adapted to oil well shooting by using the watch time-bomb mechanism case, the canister and pressure-tight bomb-case already described. In place of each watch, a pair of "delays," connected in series, are used, these being housed in slots cut in the side of the mechanism case, with their element ends downwards, as shown in Figure 3, which shows one of the firing circuits. The dotted lines show how the device is wired up with the detonators. The "delays" and batteries are held in position by means of bands of rubber or adhesive tape.

A flashlight battery, which is used for firing each pair of electric detonators coupled in parallel, provides ample voltage for overcoming the maximum resistance of a pair of "delays" plus the internal resistance of the circuit.

By using a pair of "delays," all risk of premature firing is virtually eliminated, and by duplicating the circuits the chances of failure are rendered negligible.

The timing of the "delay" is subject to very considerable variation with temperature, and Figure 4 shows this variation for the standard "6-hour delay at 65° F."

The normal well-shooting depth for wells in the English fields has been about 2000 feet, the rock temperature at this depth varying from about 80° to 105° F. The actual temperature effect to which the bomb is subjected is partly dependent upon the length of the period of circulation of drilling fluid during cleaning-out operations, as well as by the time elapsing between completion of circulation and lowering of the bomb into the well; moreover, the accuracy of the timing of the "delay" is subject to a small plus or minus variation. In practice, the firing time for this "delay" has varied between about 2 and 4 hours, and has afforded an ample margin for completing the bomb assembly, lowering it down the well, and feeding in the tamping material. This type of time-bomb has answered its purpose entirely satisfactorily, and is still being used.

Circulating Fluid and Tamping

In order to speed up operations, the technique was modified both as regards the circulating fluid and tamping. Instead of oil, bentonite water was used both before and after shooting. The hole was kept full of fluid to surface up to the time of shooting, and the amount of solid tamping was reduced to about 30 linear feet of crushed gypsum. Early results from this technique were encouraging.

The alteration in technique coincided with changes in general conditions owing to shooting taking place in another producing area with different sandstone development. The principal change in procedure included the shooting in certain wells of two or more of the producing sands.

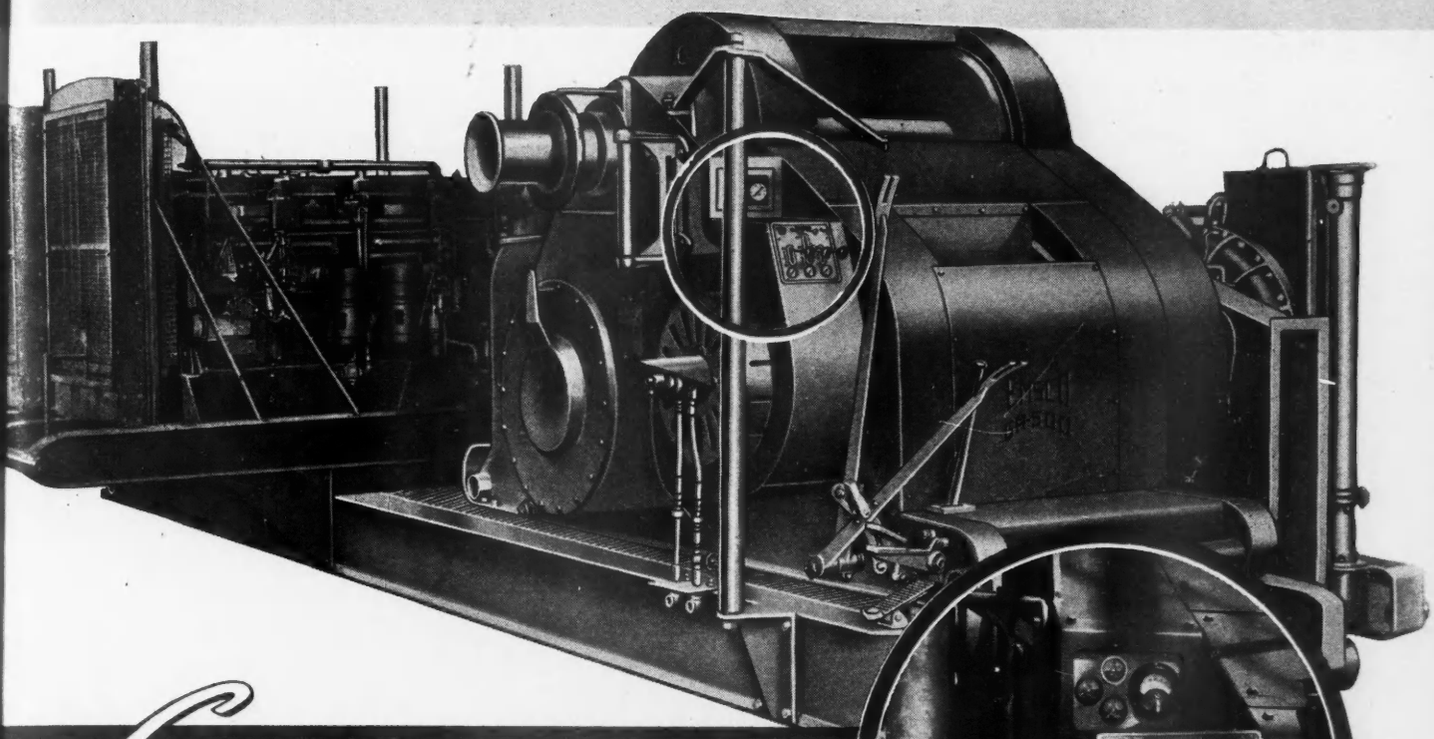
The changes in conditions also included a reduction in the diameter of a number of the wells from 7¾ inches to 5⅜ inches or 5⅝ inches, resulting in the maximum practicable charge being reduced from 400 to 300 pounds or even 200 pounds of explosive, and the maximum practicable concentration from 12 or 13 pounds to six or seven pounds per foot.

The earlier technique, averaged over the results of seven wells shot, showed an improvement in oil production of 129 percent and of fluid production 136 percent, while the later technique, averaged over the results of 34 wells shot, showed 47 and 90 percent, respectively, for oil and fluid. The aggregate improvement for these 41 wells amounted to 61 percent oil production and 93 percent fluid production.

The bentonite fluid tamping has certain disadvantages. First, cleaning out with bentonite water, even if the specific gravity and viscosity are kept down to the minimum required to circulate out the debris, is liable partially to mud-off the producing sand, or to increase its resistance to flow by mere loss of water to the formation.

Second, it reduces to some extent the efficiency of detonation owing to compression and uneven redistribution of the air in the blasting gelatin; and the back

EMSCO GA-500 DRILLING RIG



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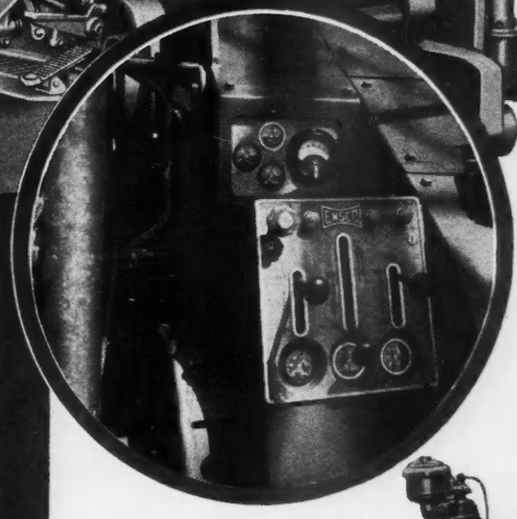


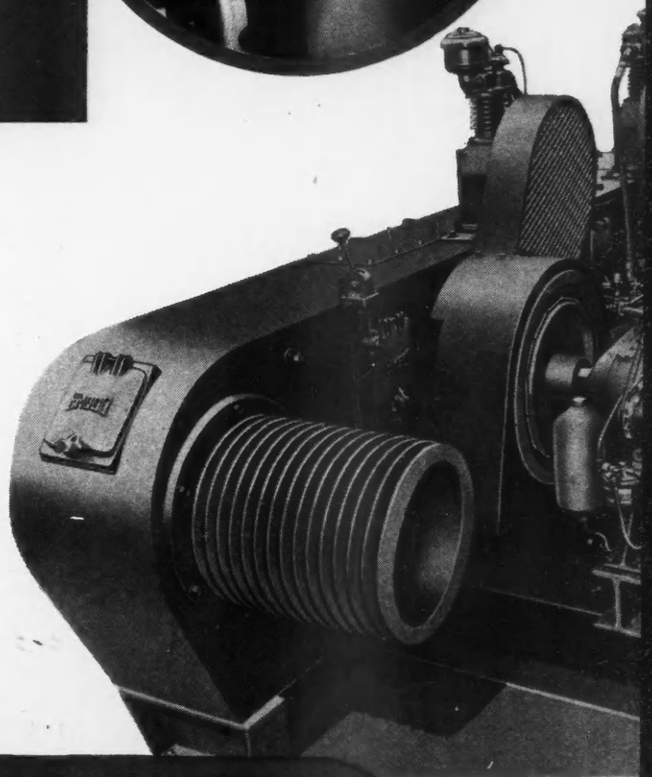
▲ All bearings and chains of the Emsco GA-500 Rig are lubricated with oil circulated under pressure by positive displacement pumps.

▲ Transmission chains are lubricated by oil fed through hollow hub sprockets to the inside of the chain.

▲ All friction clutches are air actuated and controlled from the driller's position.

▲ Slush pump drive sheaves are of the standard V-belt type.

▲ Type "J" brake has 350° arc of contact on 42" diameter water-cooled rims, 54:1 linkage ratio, centralized linkage lubrication.



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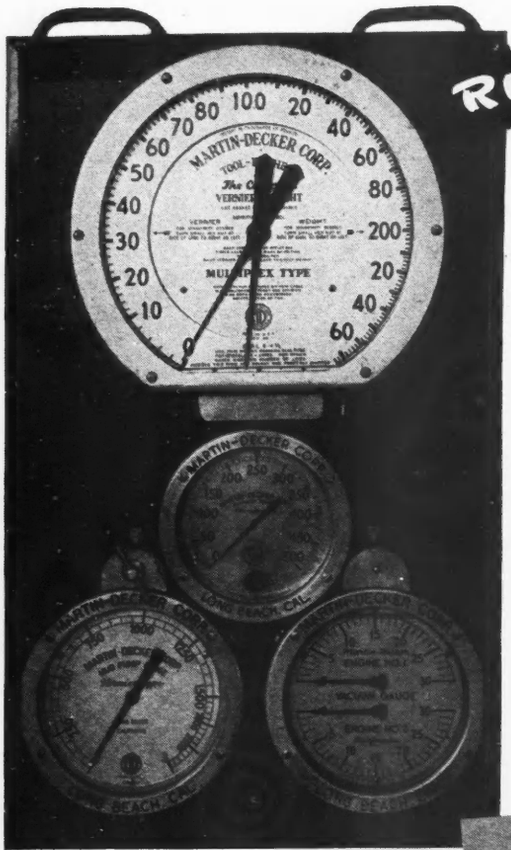

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pressure due to the fluid head (particularly in a field which is depressured) exceeds the reservoir pressure and the debris may be forced back into the fissures, where it tends to form bridges.

In view of this, the technique has been modified. The hole is cleaned out with oil circulation, but it is not bailed down until after the charge and time-bomb have been placed in position. For tamping, a solid plaster plug takes the place of the gravel or crushed gypsum and bentonite water to surface. It will be noted that this procedure reverts to solid tamping, low fluid back pressure at the moment of explosion, and cleaning out with oil circulation, but it is much more rapid as the result of modifications in application.

Details of this modified technique: A preformed plug made by filling a five-foot length of asbestos cement liner with plaster is first lowered and placed in position above the time-bomb. An "umbrella" attached to the bomb container prevents the plug from coming into contact with it.

Charges of freshly mixed plaster are then lowered in a dumping bailer provided with a glass disc, which is broken by means of a dart of suitable length. The first dump of plaster packs round the preformed plug and the subsequent dump builds up the plug to the requisite height of about 15 feet. After 1½ hours to allow the plaster to set, the oil in the hole is bailed down to a depth at which the pressure due to the remaining column is exceeded by the reservoir pressure.

For the purpose of carrying out those operations which must be performed after the placing of the time-bomb, a long "delay" time-bomb (seven days at 65° F.) of the same type as that described above is used. At average reservoir temperature, such a "delay" fires the charge within about 40 to 50 hours.

Acknowledgements

The author desires to express his thanks to the chairman and directors of the Anglo-Iranian Oil Company, Ltd. The D'Arcy Exploration Company's shooting operations described in this paper were carried out under the supervision of D. Comins and R. K. Dickie. Also R. E. Ward of I.C.I. (Explosives), Ltd., for his assistance; and to Colonel F. S. Macrae and L. Gouldstone of the Ministry of Supply for their co-operation with the author in adapting the present timing device to well shooting.

Well-Shooting in U. S. Oil Fields

In well shooting operations in U. S. oil fields and when there is sufficient reservoir pressure in a well to clean shot debris from the producing formation, it is not customary to bail down the fluid level unless such fluid level be below the casing shoe. It has been the experience

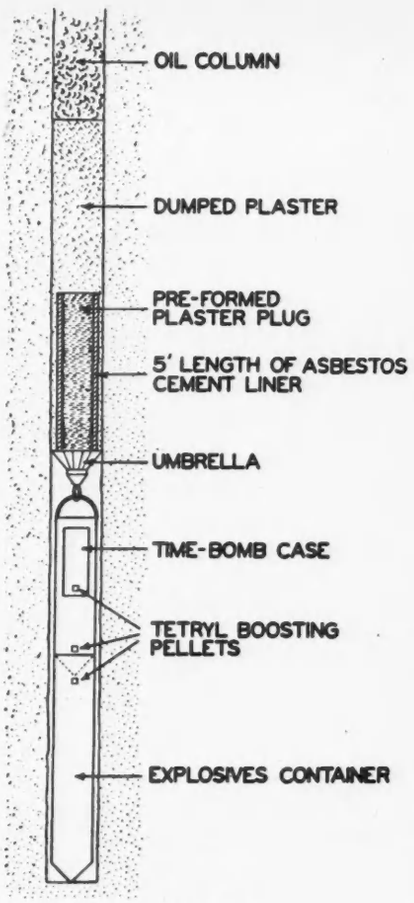

FIGURE 5
Diagrammatic setup of shot using solid plaster plug.

that since damage to casing almost invariably results at a fluid level it is preferable either to bail down to a point below the casing or to fill the well to overflowing.

Referring to fissures resulting from the explosion of the shot in the well bore, U. S. explosives engineers believe that in the strict sense of the word fissures do not result from shooting unless this occurs near a cave so that material involved is actually displaced. That which actually occurs is some hole enlargement and practically invisible fractures which act to interconnect pore spaces or oil pockets to permit drainage which would not otherwise occur by gravitation or by reservoir pressure. The range or extent of such fractures is a function of shot-loading density, of rock frangibility, of the shattering power of the explosive, and of the degree of confinement, or of a combination of these factors.

Reference is made to the use in the Nottinghamshire well of blasting gelatin and the use of tetryl pellets therewith as boosters to insure propagation. U. S. well shooters have discarded blasting gelatin, strictly as such, and it has been replaced by an improved 100 percent gelatinized oil well explosive which can be used without boosters where pressure does not exceed 2000 pounds per square inch. Generally, where pressure exceeds that figure, a liquid nitroglycerin is recommended, as any gelatin explosive at such pressure may fail entirely or at best detonate at low velocity and efficiency, as has been demonstrated in the Rangely field, Colorado. There such failure is due to collapse of the gelatin eliminating all voids and changing it from a spongy texture to a dense, insensitive syrupy mass which then occupies only about 60 percent of its container at the bottom of such container, thus leaving a gap between charges in separate containers, a gap which the wave of detonation does not jump except at high temperature. Coincidentally, each such gap leaves a bottle-neck in the shot zone which may cause a fishing job.

Wartime shortages apparently accounted for the type of time-bomb which was used in shooting the Nottinghamshire well. The device as described has some of the earmarks of the devices used in American oil fields about 20 years ago.

Time bombs in present use in U. S. oil fields have developed to meet the needs for deeper wells and higher bottom-hole temperatures. They are designed for the most severe conditions, for accurate timing and for rugged simplicity. Presumably U. S.-type bombs would be more economical both from the standpoint of first cost and insurance against failure and accident. These bombs are made in three groups, i.e., the 12-hour duplex, the 24-hour duplex, and the 120-hour duplex ranging in cost from $77 to $150. Each of these time-bombs can be selectively set for any desired number of hours.

The tamping of shots employing gypsum cement in lieu of bentonitic mud or other materials compares with current practice in this country. However, operators do not as a rule bail out drilling mud or other fluids preparatory to placing the gypsum cement slurry. It is the practice to lower this slurry through the fluids and to dump it from the bailer which has a shearing disc at the bottom, this disc being sheared by bringing the bailer into forceful contact with a rock bridge previously set above the explosive charge.

The oil industry, from the standpoint of actual production, is quite new in England and English engineers and technicians will meet problems which have been met and solved in the U. S. oil fields. Continued exchange of ideas through the publication of technical papers, as well as closer collaboration between members of the petroleum engineering profession in England and the United States should result in worthwhile advantages to operators on both sides of the seas.

Intensive Exploration Program Seen Following Imperial's Leduc Discovery

By C. O. NICKLE
Staff Writer

Since the completion of Imperial Oil Ltd.'s Leduc 1 discovery well near Edmonton on February 13, 1947, the greatest lease, reservation and exploration play in Western Canadian history has gotten under way, taking in virgin territory extending 125 miles north and west of the discovery and 175 miles south and east of the well. The belt ranges in width up to 100 miles.

The well came in with an initial flow of 950 barrels daily of 39-gravity oil from a Devonian limestone porous zone at 5029-66 feet, the largest oil flow yet recorded in Western Canada outside of the Turner Valley field.

Leduc 1 was the first deep completion in this sector of Canada. Early in March, the area's second wildcat was completed as a failure. It was McColl-Frontenac Oil's Wetaskiwin 1, about 32 miles southeast of the Leduc discovery. The test was abandoned at 6502 feet after penetrating the Devonian beyond the level where the Leduc well obtained oil.

Imperial is drilling three offset tests to the discovery well and a fourth rig was being placed in operation at the end of April. The Leduc 2, 1¼ miles south of the pool opener, was drill-stem testing at 5109 feet and the other two active tests were drilling near 5000 feet.

Independents, who bought into sev- and California Standard—and a long list within a six-mile radius of the discovery, plan to put three or more rigs to work immediately if the current Imperial follow-ups are successful.

Leasing Activity

Four majors—Imperial, McColl-Frontenac, Gulf Research & Development, and Calofirnia Standard—and a long list of independents followed up the Leduc strike by an active leasing and reservation program, with total holdings in the region at this date in excess of seven million acres.

Imperial doubled its regional holdings —to more than two million acres—and expanded its exploration program. It has five seismograph parties operating in the region, and is following up all structural indications with drilling. It has started its Battle Lake 1 wildcat in lsd 16 12-46-3w5th, about 35 miles southwest of the Leduc discovery, and will start another this month about the same distance north of Leduc.

McColl-Frontenac, Canadian affiliate of The Texas Company, also doubled its regional holdings—to more than 1,100,000 acres—has a seismograph party following up work done in 1945-46, and plans to put down at least two wildcats this spring. First wildcat will be announced shortly.

Gulf Research & Development, which had been carrying out gravity meter work in the East Red Deer region 80 miles southeast of Leduc since 1945, expanded its reservations from half a million to more than two million acres after the Leduc discovery, tying on to the south and north of the Imperial-McColl-Frontenac blocks centered on Leduc. Gulf now has two gravitymeter and one seismograph in operations, plans to bring in additional parties and probably also aerial magnetometer later this spring. Gulf's initial drilling is likely to get under way this summer.

To the southeast of the Gulf Red Deer holdings, California-Standard acquired quarter of a million acres in mid-1946. This holding has been extended farther south and east, to more than a million acres and the company is starting a structure test drilling program immediately.

Anglo Canadian Oil, Home Oil and C. & E. Corporation have started a joint wildcat on large holdings at Beaverhill Lake, 50 miles east of Leduc, while Anglo Canadian and C. & E. have started a structure test drilling program at Wabamun Lake, 25 miles west of Leduc.

Through the whole region, geological, geophysical and drilling operations have been handicapped so far by winter weather and road conditions resulting from spring thaw. Regardless of the size of the pool tapped by Imperial-Leduc No. 1, or the results at the follow-ups now drilling, the region will be a scene of intense exploratory activity this season. If Imperial's Leduc follow-ups are successful, intensive drilling by that company and others can be expected in the immediate area.

Resigns from Pemex

Ing. J. M. de la Garza Cardenas, production manager of Petroleos Mexicanos in charge of production, drilling and pipe line transportation since 1938, has resigned to enter private business.

Ing. de la Garza

De la Garza graduated from the University of California as a petroleum engineer in 1927 and was one of the first Mexicans to hold this title.

After eight years with the Mexican government's petroleum department, De la Garza became representative for Dow Chemical Company in Mexico. After the oil expropriation in 1938, he joined Pemex and took over the organization of the production department.

Standard's West Taber Area Due for Activity

Standard Oil of British Columbia, subsidiary of Standard Oil Company of California, will step up its development of the West Taber area, southern Alberta Plains, Canada, as result of the highly successful completion of its initial 1947 extension test in this area. Its Taber-Province 63-15A, SW lsd 6 15-9-17w4th, has been placed on production with 159 barrels per day initial flow through 10/64-inch choke. The oil is water-free, 22-23 gravity. The well is producing with a low (about 500 cubic feet per barrel) gas-oil ratio.

The success is quarter of a mile south of Standard's Spring 1946 completion, No. 65-15A, which showed 250 barrels a day flow through 16/64-inch choke, 120 barrels daily through 10/64-inch choke. Previous completions in the pool, to the north of 65-15A, were pumpers ranging up to 100 barrels daily.

Pemex Plans Participation In College Training Work

The National University of Mexico, one of the oldest universities in the western hemisphere, has announced it will soon create a special course in petroleum engineering within its planned Mexico City University Center. Petroleos Mexicanos, the Mexican government-controlled oil company, will contribute $300,000 for the building of the classrooms and laboratories.

Pemex, with a practical monopoly of the oil industry in Mexico, has had to rely to a great extent upon foreign technicians and explained that this move is to provide competent Mexican technical personnel for the petroleum industry.

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Colombia's Production Shows Drop for February

Crude oil production in Colombia during the month of February totaled 1,717,777 barrels, or 61,349 barrels daily for the 28-day month. This is a decrease from the 2,109,763 barrels produced during January, or 68,057 barrels daily for the 31-day month.

Tropical Oil Company's output during February was 770,819 barrels. Production by fields during the month was as follows: Infantas, 229,055 barrels; La Cira, 529,384 barrels; Colorado, 11,216 barrels, and Galan, 1164 barrels.

Colombian Petroleum Company's production amounted to 589,556 barrels during February. The output was distributed as follows: Petrolea, 260,651 barrels; Tibu (K), 29,602 barrels, and Tibu (T), 299,303 barrels.

Compania Colombiana de Petroleo el Condor's output at Casabe was 357,402 barrels.

High Costs Worry Creole In Venezuelan Operations

Concern over the increasing cost of producing oil in Venezuela due to higher costs of oil finding, labor and materials, was expressed by A. T. Proudfit, president, Creole Petroleum Corporation, in his annual report to stockholders.

"If Venezuela's oil is to maintain a strong competitive position under all market conditions, including those which may result from development of the Middle East as an important source of supply, it is essential," Proudfit said, "that the recent rapid rate of increase in the cost of labor, material, and taxes in Venezuela be checked."

As a result of Creole's 1946 operations the government will receive a total of $80,083,234 in royalty and other taxes, the head of Creole said.

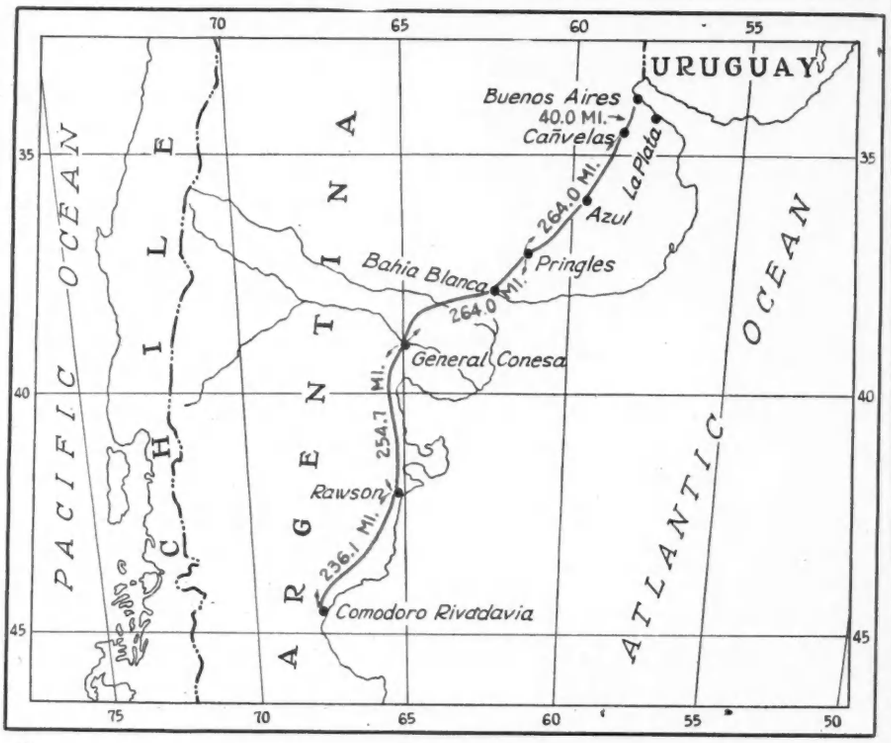
Yumen Completes 3 Wells, Taiwan 4, During 1946

Crude oil production in the Yumen field, Kansu province, China, during 1946 amounted to approximately 512,810 barrels, according to information received by the Department of Commerce. The output of natural gas was 506.9 million cubic feet.

Gas production in the Szechwan field was 249.1 million cubic feet while production on Taiwan (Formosa) included 1370 million cubic feet of gas and about 16,000 barrels of oil.

Drilling activities included completion of three wells at Yumen and four on the island of Taiwan.

Argentine Gas Line Work Started



CONSTRUCTION work on the first section of a 1100-mile natural gas pipe line from the Comodoro Rivadavia fields to Buenos Aires, Argentina, has been started by Direccion General de Gas del Estado (Argentine government gas services).

The line, originally developed in 1936 by a committee of engineers representing the Argentine Government Oil Fields (YPF), is to have a capacity of 35 million cubic feet daily with a calorific value of 1030 BTUs per cubic foot.

The cost of the line with its compressor stations and auxiliary equipment has been estimated at $25 million but with present increase in the cost of materials and labor probably will run near $50 million. The present design contemplates use of 10¾-inch pipe with two or three compressor stations to boost the pressure to 1000 psi.

The carrier will be built according to American standards and will be protected against corrosion by priming paint, asphalt and asphalt impregnated asbestos covering. Compressors will use natural gas for prime movers and the stations will be built underground as protection against bombardment. The line will run along existing highways and will touch the most important cities in the Patagonia and southern part of the state of Buenos Aires.

A special commission, headed by Ing. T. Tabanera, sub manager of Direccion de Gas, was sent to the United States in search of steel pipe and other material with short delivery schedules, and to interest U. S. pipe line contractors in constructing the four sections. In the event efforts to obtain materials in the United States fail attempts will be made to find equipment in Europe.

The carrier initially will have a working capacity of 21 million cubic feet daily and will serve about 3½ million people.

Direccion de Gas del Estado has already built a 40-mile 3-inch line from the Tupungato field to the city of Mendoza and future plans call for the construction of a gas line from the Plaza Huincul fields to connect with the Comodoro Rivadavia-Buenos Aires line.

Gas production of Comodoro Rivadavia in 1945 reached approximately 15 billion cubic feet and the total gas reserves of Argentina were recently estimated at about 1412 billion cubic feet.

DGE is fostering the use of gas throughout the Argentine. The government declared in a recent decree that all gas industries are public utilities and DGE is taking over the privately owned gas manufacturing plants.

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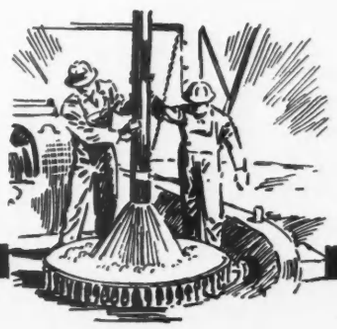

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British Mission Ascertains Wants Of Operators in Caribbean Area

British goods are favored but difficulties are being experienced in supply and delivery, the British Mission to the Caribbean area declared in its recent report.

The mission, organized by a group of members of the Council of British Manufacturers of Petroleum Equipment, visited oil areas of the Caribbean area during the latter part of last year to observe the manner in which equipment supplied to oil fields and refineries was used under service conditions.

"Throughout the whole area great interest was shown in equipment from British suppliers and in the majority of cases those concerned wished to purchase in Britain and in fact do so if the equipment is of satisfactory design and to American standard specifications," the report said.

Field superintendents stressed that British equipment should be standardized to tie up with American standards in design and in materials.

British vs. American

In general no serious complaints about British items which are in use were made to the mission, except that in many cases it was cited that the equipment was too elaborately finished or too heavy for the job compared with the American equipment, thereby giving it a disadvantageous price differential.

Two points were stressed as of fundamental importance—the material should be as completely foolproof in design as possible to minimize damage in operation and the materials used in manufacture should be of the best quality.

"We must be prepared to give them this equipment at a reasonable price and with fairly quick delivery," the report commented. "We must also be prepared to see this equipment put under the most stringent field conditions and tests, in some cases even to absolute abuse."

A point frequently made to the mission was that of service after purchase. In this respect many British suppliers do not compare with American manufacturers.

"The American manufacturer is not content with a single visit, but makes regular and frequent calls on the local managements to ascertain if his article is giving satisfaction and, even more important, to find out whether it can be improved," the report said.

Standardization was one of the most important items brought to the notice of the mission and possibly the one most frequently referred to by all the technical men met in connection with the oil industry.

"They were insistent that if supplies are produced in Britain they should conform with existing oil industry specifications particularly as regards size, as outlined in the American specifications ordinarily used," the report cited.

The mission reported that it was impressed by the scale on which future refinery operations will be conducted in the Caribbean area.

The mission traveled 8000 miles and contacted oil companies in Trinidad, Venezuela, Colombia, Aruba and Curacao.

Czechs Finding Synthetic Unit Expensive to Operate

In all Eastern Europe outside the U.S.S.R. and Germany the present production of synthetic oil does not exceed 150,000 tons (about 1 million barrels) annually. In this area there is only one major plant operating—the coal hydrogenation plant at Brüx—mostly in Czechoslovakia (the famous Stalin works). The Czechs reportedly are finding this plant expensive to operate, and restoration to its full capacity of 750,000 tons (about 5 million barrels) a year is doubtful.

The large hydrogenation plants at Stettin-Politz and at Bleichhammer have been dismantled and transferred to Russia. The Fischer-Tropsch synthetic plant at Schwarzheide has been allotted to Poland as war reparations and will be moved to Ausschwitz.

Burmah Plant Reopens

Rehabilitation work at Burmah Oil Company's refinery at Rangoon, India, has been resumed following a short sit-down strike of some 2000 workers. Cause of the strike was an alleged violation of a recent labor agreement.

Russian Pipe Line

Construction is under way on a 125-mile gas pipe line between Koh Tla-Jarvi in Estonia and Leningrad. This carrier will transport gas produced from heating Estonian shales in three plants, the first of which is under construction. The gas will be used for domestic consumption.

Oil Companies to Assist In Geological Expedition

Geologists from Columbia University and the American Museum of Natural History will depart for Peru in May for four months field work in the highest levels of the Andes Mountains. Marking a unique liaison between industry and basic science, the expedition will conduct scientific investigations under the joint sponsorship of four of the country's largest oil companies.

A research grant of $22,000 from Standard Oil Company (New Jersey), Gulf Oil Corporation, Shell Oil Company and Socony-Vacuum Oil Company will make possible further graduate studies for two experienced geologists as members of the expedition. At the same time, important research work which has bearing on the development of oil fields in the upper Amazon River region will result.

Dr. Norman D. Newell, professor of geology at Columbia, and curator in the department of geology and paleontology at the American Museum will head the expedition. The Museum will be represented by Robert Adlington, specialist in the department of geology and paleontology. The two graduate students, who will work under University fellowships supported by the oil companies, are Thomas G. Roberts and John Chronic, both of Lawrence, Kan.

Tarakan's 1946 Production Tops Two Million Barrels

The Batavian Petroleum Company (Royal-Dutch Shell) produced 160,200 barrels of oil in 1945 and about 2,312,300 barrels in 1946 from its field on Tarakan Island and Balikpapan, Borneo, in the Netherlands East Indies. During these years no other company produced oil in the East Indies, a report to the Department of Commerce says.

However, it is estimated that at the end of 1946 refinery production of gasoline and kerosene from oil produced under Republican auspices on the Islands of Java and Sumatra was at the rate of about 21,637 barrels daily. Under an agreement between the companies and the Republican government, the product of these fields is disposed of by the government in exchange for protection and maintenance of the fields and refineries.

The company also drilled five exploratory wells during 1946 and produced about 1,150,000 barrels of refined products from its Borneo refineries.

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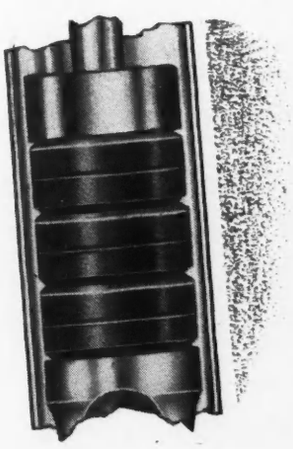

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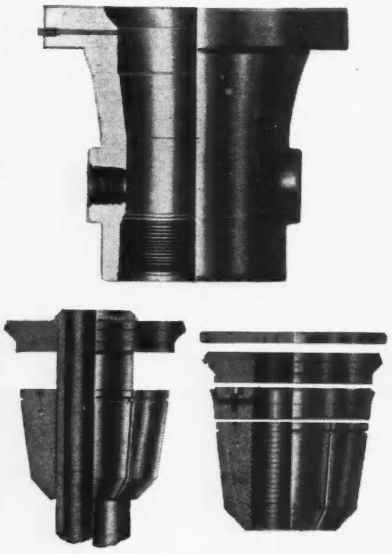
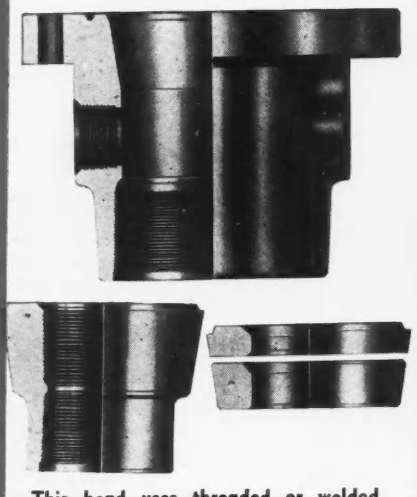
TYPE RH CASING HEAD



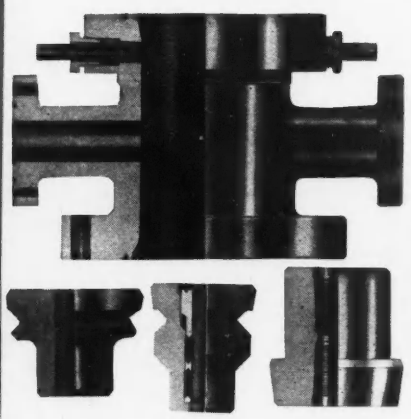
This slip suspension head, has the small welding ring seated in body after weld has been made. API ring gasket is seated in groove at juncture of welding ring and head completing the seal. Weld test pack-off can be inserted between welding ring and slips. Available in 2000 to 15,000 test pressures, with threaded or flanged bottom connection; 2" threaded or flanged side outlets.

TYPE M CASING HEAD



This head uses threaded or welded hanger suspension plus patented application of a single API ring gasket as sealing medium and hold down. Hangers cannot wedge in body . . . they will pass through blowout preventers with oversize vertical bore. Four types of hangers are interchangeable in the body: One or two piece threaded mandrel, single or double welding mandrel. The one piece threaded and double welding mandrels are shown. Available with threaded or flanged bottom connection; 2" threaded or flanged side outlets; in test pressures from 2000 to 10,000 pounds.

TUBING HEADS



These heads employ the patented Rector pressure seal, wherein a single API ring gasket acts dually as a pressure seal and hanger hold down. These three types of hangers are interchangeable in any Rector tubing head.

Type "A", left, is standard threaded hanger and available with or without groove for hold-down locking screws. Type "C", center, has packing element to seal-off around polished joint. Available with or without groove for hold down locking screws. Type "B", right, threaded hanger with extended neck for direct connection of tubing to Christmas tree.

Tubing Heads available in 2000 to 10,000 pound test pressures.

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WHAT'S NEW IN OILFIELD EQUIPMENT AND SUPPLIES

In the pages that follow, the editors of **The OIL WEEKLY** digest some of the items recently announ ed by manufacturers. Please do not clip the pages lest you impair the value of the magazine to yourself and other oil men. Simply check on the reverse side of this card the number of each item on which you wish more complete information. We'll do the rest.

Issue of May 5, 1947

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THE OIL WEEKLY

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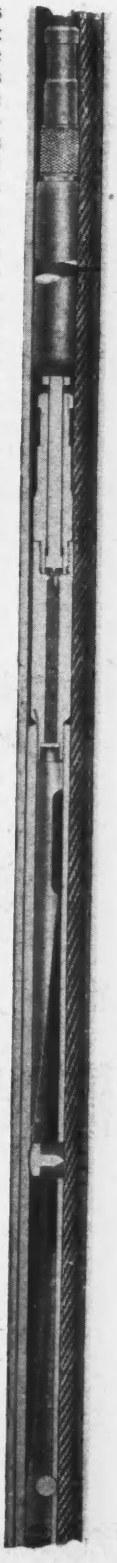
THIS PAGE

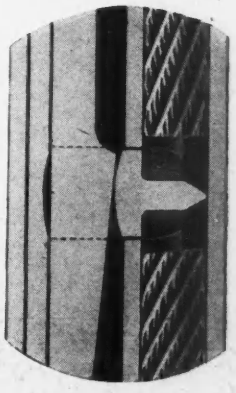
Line Cutting Tool

ine cutting tool has loped to cut stuck at the top of the et. Where wells sand and must be asionally, the haz- ck line is a serious ase the line and become stuck, it is ith this new tool, to the manufactur- 100 percent of the h recovery also fishing job less In some previous as been the prac- l on the line until oping that most of mes out. However, have been known r the top, not only pensive lines, but costly fishing jobs. l is designed to sand line to the rope socket when to the tubing and the line. When s reached bottom, is dropped in the contacts a firing top of the tool, a small charge of . The explosion wedge downward, knife against the tubing, thus cut- ne.

sand line is with- the tubing, a fish- ing socket is run into the well on a wire line, or on the sand line to fish out the drop weight and sand line cutting tool. When the sand line cutting tool is applied inside 2½-inch tubing, a sleeve is fastened around the tool so that a crimping device can be used in such a manner that when the line is cut, the drop weight and cutting tool are recovered on the cut end of the line.

M. M. Kinley Company, P.O. Box 6177, Houston 1.





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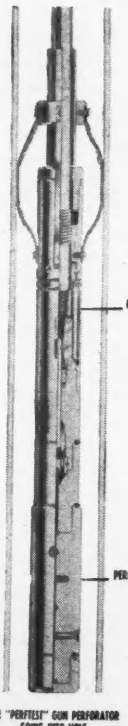
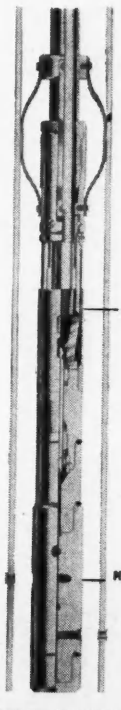


THE "PERFTEST" GUN PERFORATOR GOING INTO HOLE



THE "PERFTEST" GUN PERFORATOR SET—GUN FIRED

tubing or drill string. It consists of a mechanical firing-head to which may be attached any number of perforating gun sections. Each section fires four or five bullets to form a pattern of perforations 90 degrees apart with a vertical measurement of 2½ inches from center to center. The number of perforating gun sections to be attached to the firing-head depends solely on the number of perforations desired and the extent of the zone to be perforated.

The gun perforator is easily adapted to formation test equipment for combined perforation and test operations.

Simple top-hole manipulation of the string by the driller fires the gun perforator to perforate casing and actuates the tester assembly to test formation immediately following perforation.

The manufacturer claims that besides its wide versatility of uses the "Perftest" offers such advanced features as positive fire of all bullets; easy, fast, gun perforator maintenance; exact positioning in test zone; no extra equipment needed.

M. O. Johnston Oil Field Service Company, 3117 San Fernando Road, Los Angeles.

(Check item 2 on postcard for more information.)

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THE OIL WEEKLY, Houston, Texas

Below I have checked items on which literature or more information is desired. Please have the manufacturers send me the indicated data. (Numbers checked refer to items in your issue of May 5, 1947.)

1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
13	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**

May I ask another favor? I would like more information about item advertised on page_____ of this issue by_____ Company.

Name_____ Title_____

Company_____

Address_____

City_____ State_____

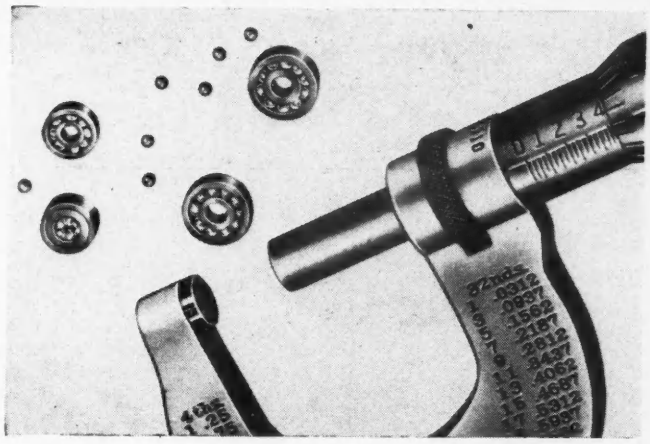
(Print or type clearly name, company and mailing address)

NEW EQUIPMENT LITERATURE

FOR ADDITIONAL INFORMATION, USE MAILING CARD INSERTED OPPOSITE THIS PAGE

1—Micro Ball Bearings

A line of precision, solid-race ball bearings in radial and pivot designs is being produced in quantity in both English and metric dimensions from 5/32- to ⅜-inch outside diameter. These bearings have been designed for compact mechanisms or instruments, where accuracy, low friction, high capacity and long life are important.



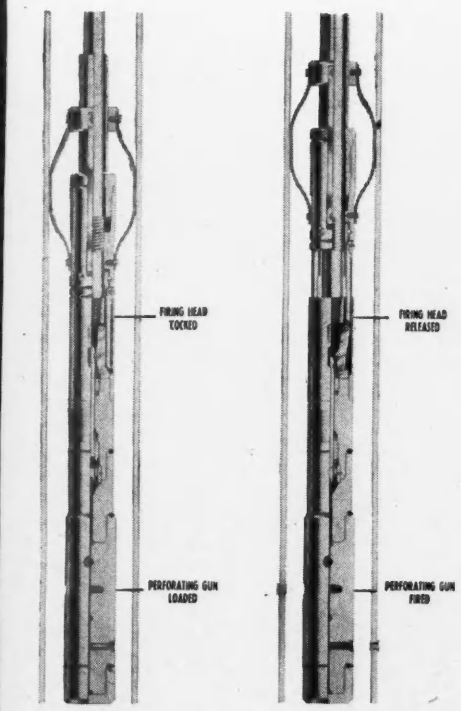
Full-race radial bearings of ¼- to ⅜-inch outside diameter in inch sizes, and pivot (angular ball-contact) bearings from 5/32- to ⅜-inch outside diameter are offered. The pivot ball bearings will tolerate substantial misalignment of shafts, according to the manufacturers, and are fitted with dust caps. All bearing rings and cups are machined from solid bar alloy steel, heat-treated to optimum properties, micro-finished on running surfaces and ground on the exterior. Special non-corrosive or non-magnetic materials also are available. Normal tolerance for all sizes and types is A B E C 1, as in standard precision bearings. For finer requirements, the radial bearings are also available in A B E C 5 (A-series).

New Hampshire Ball Bearings, Inc., Peterborough, N. H.

(Check item 1 on postcard for more information.)

2—Gun Perforator

The "Perftest" all-purpose gun perforator furnishes operators with a safe, mechanically-operated gun perforator which can be run in the well on tubing or drill string. It can be used for perforating alone, or, when attached to a pressure recorder and formation tester, as the perforating unit in combined perforation and formation testing operations.



THE "PERFTEST" GUN PERFORATOR GOING INTO HOLE

THE "PERFTEST" GUN PERFORATOR SET—GUN FIRED

For perforating casing the gun perforator is lowered to the zone selected for perforation on the bottom joint of tubing or drill string. It consists of a mechanical firing-head to which may be attached any number of perforating gun sections. Each section fires four or five bullets to form a pattern of perforations 90 degrees apart with a vertical measurement of 2½ inches from center to center. The number of perforating gun sections to be attached to the firing-head depends solely on the number of perforations desired and the extent of the zone to be perforated.

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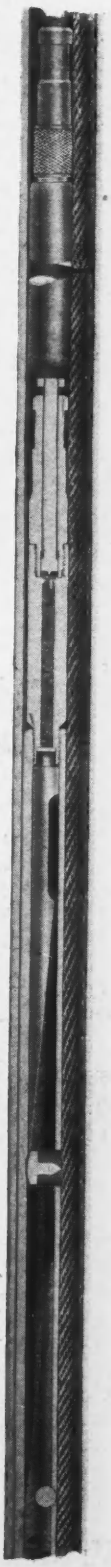
M. O. Johnston Oil Field Service Company, 3117 San Fernando Road, Los Angeles.

(Check item 2 on postcard for more information.)

3—Sand Line Cutting Tool

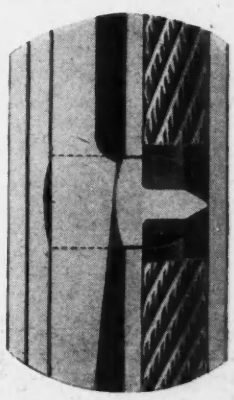
A sand line cutting tool has been developed to cut stuck sand line at the top of the rope socket. Where wells make some sand and must be bailed occasionally, the hazard of stuck line is a serious one. In case the line and bailer do become stuck, it is possible with this new tool, according to the manufacturers, to save 100 percent of the line, which recovery also makes the fishing job less difficult. In some previous cases, it has been the practice to pull on the line until it parts, hoping that most of the line comes out. However, such lines have been known to part near the top, not only ruining expensive lines, but resulting in costly fishing jobs.



The tool is designed to follow the sand line to the top of the rope socket when dropped into the tubing and attached to the line. When the tool has reached bottom, a go-devil is dropped in the hole, and contacts a firing device on top of the tool, setting off a small charge of explosive. The explosion drives a wedge downward, forcing a knife against the wall of the tubing, thus cutting the line.

After the sand line is withdrawn from the tubing, a fishing socket is run into the well on a wire line, or on the sand line to fish out the drop weight and sand line cutting tool. When the sand line cutting tool is applied inside 2½-inch tubing, a sleeve is fastened around the tool so that a crimping device can be used in such a manner that when the line is cut, the drop weight and cutting tool are recovered on the cut end of the line.

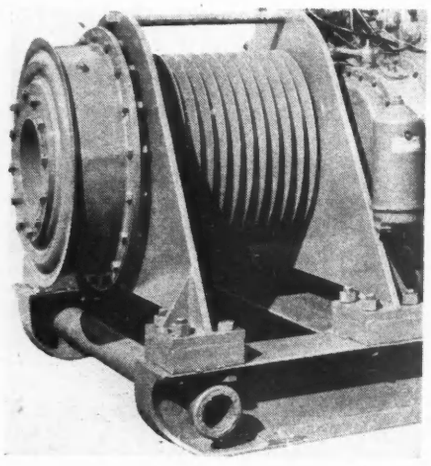
M. M. Kinley Company, P.O. Box 6177, Houston 1.



(Check item 3 on postcard for more information.)

4—V-Belt Mud Pump Drive

An unusual V-belt drive has been developed for mud pump applications which makes it possible to place a 7¼x14-inch mud pump and a 260-horsepower twin diesel engine on one skid within the eight-foot allowable road limit. The engine drives through a hollow shaft and a coupling, with the sheave located between the engine and the coupling. The assembly is 102½ inches long with coupling in place, but may be reduced to 96 inches by the simple expedient of removing the bolts which hold the coupling to the hubs of the shafts.



With this new design the sheave is keyed to a hollow shaft which rides in heavy-duty self-aligning SKF bearings with the bearing cages bolted to the heavy side plate supports. The engine shaft projects through the hollow shaft and is under pure torsional loading through the Falk airflex coupling. In this manner a sheave "side load" is actually taken within the length of a shaft which carries torsional load only. At the same time, the pulsations of the mud pump are absorbed by rubber in the coupling before they reach the engine shaft.

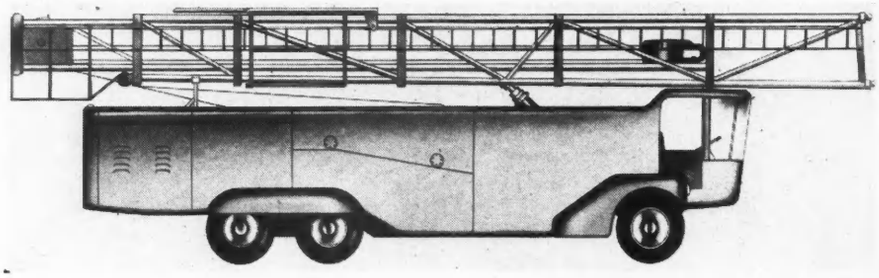
In order to secure the desired strength in the hollow shaft which supports the sheave, bearings of exceptionally large diameter (270 mm.) were employed. These are lubricated by Alemite fittings and provided with an overflow to prevent "hydraulicing" the bearing.

The sheave has a 20-inch pitch diameter and is provided with 12 grooves to carry the 296 maximum horsepower output of the twin diesel at 900 revolutions per minute shaft speed.

It is possible to utilize any engine drive with this device. Whereas the twin engine has builtin clutches, on other engines the power takeoff shaft may be bolted directly to the engine fly wheel and a Fawick airflex clutch or similar clutching device may be used instead of the Falk coupling. In this manner, the length of the assembly could be shortened by omitting the usual clutch belt housing.

Anderson-O'Brien Company, 746 East Washington, Los Angeles 21.

(Check item 4 on postcard for more information.)



5—Portable Servicing Rig

Model 321, self-propelled servicing and drilling rig, is designed to service wells to 4000 feet and to clean out, deepen and workover wells to 2500 feet. It has a net hook horsepower of 117 and will start 4000 feet of 2½-inch tubing off bottom at 90 feet per minute with three lines strung on the block.

The unit is comprised of a double drum hoist with single engine drive, torque converter or gear transmission, right-angle gear box and portable telescoping derrick of unusual design, all integrally mounted on a streamlined six-wheel chassis. Rotary countershaft with propeller shaft rotary drive and regular and automatic catheads are offered as accessory equipment. Speed of moving and erection has been a prime consideration in the design. The portable rig may be driven into the location nose first instead of backing in. This provides easier, faster spotting at the well location.

Functional design provides balance with less weight, it is claimed. There is less load over the front wheels. Power controls are placed at the derrick leg to allow the best possible operating vision. The motor, located at the rear of the unit, is easily accessible and completely enclosed by streamlined contour guards. It is available with gas, gasoline, butane or diesel engine and with a torque converter or gear box at the operator's option. This light-weight unit complies with California highway regulations when equipped with Waldrip-Western 65-foot, 60,000-pound or 90,000-pound hook load capacity telescoping derrick.

Waldrip Engineering Company, Los Angeles.

(Check item 5 on postcard for more information.)

6—Tubing Joints

A new tube-joint, designed to protect tubing, speeds up handling and permits various uses of tubing in well completion and reworking operations where otherwise a string of drill pipe might be required.

Tube joints are made from select high-alloy steel stock, heat treated and carefully machined and gauged to assure 100 percent interchangeability and long service. Pipe end threads are API with tube joint threads modified API form. Joints are available in all tubing sizes and thread types.

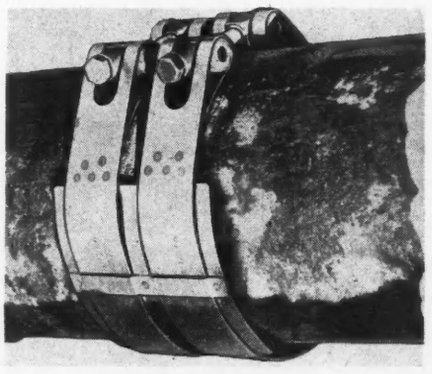
The new joints eliminate costly wear and tear on tubing, save time on round trips, prevent damaged or crushed tubing from tong action and provide full opening for swabs and bottom-hole instruments, according to the manufacturers.

Longhorn Machine Works, 6823 Navigation Blvd., Houston.

(Check item 6 on postcard for more information.)

7—Pipe Leak Clamp

A new line of high-pressure pipe leak clamps is said to withstand pressures to 1100 pounds per square inch on corroded pipe without leaking. Designed as permanent repair clamps for high-pressure pipe leaks of oil, gas, water, etc., these stainless steel clamps weigh up to a maximum of only six pounds, and can be installed by one man. Interesting features of these clamps include extreme high strength and corrosion resistance; laminated Hycar rubber pads which compress into corroded area of pipe when under pressure while resisting the tendency to cold flow; and a stainless steel patch plate, which slides on clamp band, affording the most advantageous positioning of clamp over leak.

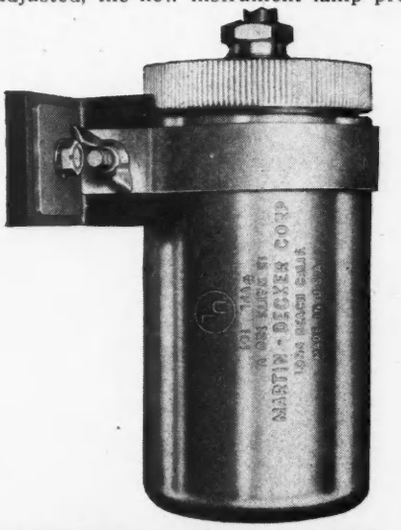


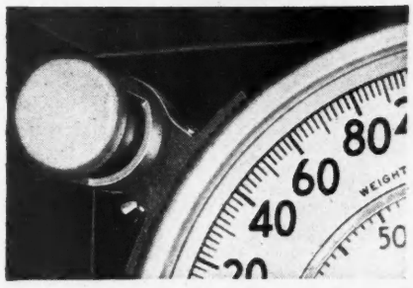
Marman Products Company, 940 W. Redondo Blvd., Inglewood, Calif.

(Check item 7 on postcard for more information.)

8—Instrument Light

An adjustable vapor-proof and moisture-proof lamp developed for mounting on drilling control instruments has been introduced. Extremely rugged and easily adjusted, the new instrument lamp provides maximum oilfield usefulness and service in making dials and gauges clearly visible day and night.





It has been tested by the Underwriter's Laboratory and bears its seal of approval. It is made of die cast aluminum with pyrex glass tubing and equipped with 20 feet of three-cable cord and cord cap. The 15-watt lamp is set in a cork gasket. The lamp is said to be extremely compact, measuring only 5½ inches long and 2¾ inches in diameter. A flexible rubber bracket is provided for mounting the fixture on a gauge ring or panel.

Martin - Decker Corporation, 3431 Cherry Avenue, Long Beach 7, Calif.

(Check item 8 on postcard for more information.)

Literature

9—Tanks

An 80-page booklet, "The Choosing and Using of Tanks," considers the important factors in selecting tanks. The points discussed in the illustrated booklet were largely gleaned from questions asked of the branch managers of Black, Sivalls & Bryson, Inc., and represent the accumulated experience of a considerable number of men, over many years, with a large variety of production tank problems. Gwynne Raymond, chief engineer of the company, who prepared the book, originally presented "The Choosing and Using of Tanks" as an illustrated lecture before the chapters of the API.

Black, Sivalls & Bryson, Inc., 720 Delaware, Kansas City 6.

(Check item 9 on postcard for more information.)

10—Bearing Handbook

A 168-page manual, No. 15, combines engineering and application data reference for ball radial, ball reciprocating, radial roller, taper roller, and thrust bearings. This manual completes a series of three volumes published to provide full bearing engineering data and to furnish an authoritative guide in the proper selection of suitable anti-friction bearings for all types of applications.

Others previously issued in the series include the 153-page Catalogue No. 32, "Torrington Needle Bearings, Engineering and Application Data"; and Bulletin No. 200, "Self-Aligning Spherical Roller Bearings." An attractive leatherette ring binder is provided with Manual No. 15 in order that engineering vice presidents, chief engineers, chief draftsmen and similar executives can combine the three volumes and thus have at their finger tips a handily indexed and complete reference work of anti-friction bearing information.

Torrington Company, Bantam Bearings Division, South Bend 21, Ind.

(Check item 10 on postcard for more information.)

11—Pipe Line Pumping

Typical diesel engine applications in pumping petroleum products from oil fields to consumers are outlined in the new eight-page color booklet, "Pipe Line Pumping on Schedule." The publication, Form 9781; stresses the use of such engines as prime pumping units and booster units in gathering stations to maintain a continuous flow of oil and gas. The well-illustrated publication points to the application of diesel engines to rotary drill and mud pump operation and diesel-powered tractors to pipe line laying.

Caterpillar Tractor Company, Peoria 8, Illinois.

(Check item 11 on postcard for more information.)

12—Rotary Table

Sectional views, blueprints, explosion photographs and complete specifications of the Ideal SHS-20½ rotary machine are presented in Bulletin 340. The photographs include shop views of the cutting of the spiral bevel gear train of the machine. The spiral gears provide smoother and quieter running because of the continuous overlapping of several teeth. Other features are the heavy-duty, ball-type main and hold-down precision bearings and the fact that the machine is completely sealed against mud and foreign matter.

The National Supply Company, Box 899A, Toledo 1.

(Check item 12 on postcard for more information.)

13—Chains

Bulletin 46-10, "REX Steel Fabricated and Cast Chains for Every Industry," illustrates and briefly describes standard chains. Three pages of photographs show examples of how each style REX chain is applied in industry; two pages illustrate standard attachments and their use; and one page contains information on REX cast and cut tooth sprockets.

Chain Belt Company, 1600 West Bruce Street, Milwaukee 4.

(Check item 13 on postcard for more information.)

Gotkool
WATER CANS
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Gott
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GOTKOOL WATER CAN
Made in 1½, 2, 3, 5, 10, 15 and 20 gallon sizes. (Push-Button Faucet at slight additional cost.)
GOTT Water Cans are the practical way to keep drinking water cool for long periods, protected from impurities and always handy to the job. Snug fitting large removable top, strongly built to withstand rough usage.
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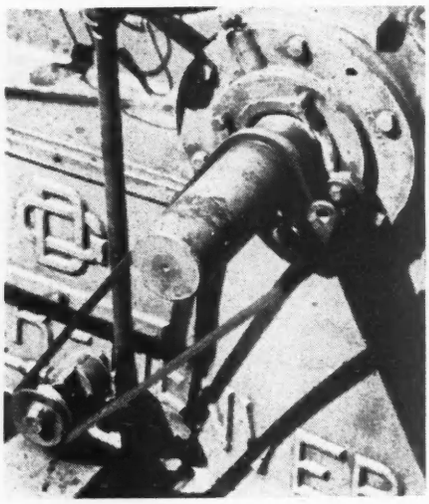
How to Take up Slack in V-Belt Drive on Pump Lubricator



BELT DRIVES

Ample lubrication in the glands and shafting of the mud pumps is assured by the ingenious lube-oil pump devised by one drilling contractor. A small reservoir designed for the purpose and made of a section of 10-inch casing was mounted atop the skid base beside the slush pump where it collects excess oil drained from the sump beneath the glands and which is re-circulated by means of a small automotive-type centrifugal pump. The latter is operated by a V-belt running over the high speed shaft on the power end of the pump.

Slack in the belting is taken up with a simple device consisting of the roller portion of a link of rotary chain. This unit is bolted to the gland housing, using one of the existing bolts. The belt, looped over the roller as illustrated, may be tightened simply by rotating the link counterclockwise, then cinching down the bolt holding it in place.

The entire unit is simple to construct, takes up little space on the pump base, and is easily dismantled, although for normal hauling between locations, the assembly need not be disassembled.

$5.00 is paid for each illustrated acceptable contribution. Mail to The Editor, THE OIL WEEKLY, P. O. Box 2608, Houston 1, Texas

PENBERTHY

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WATER GAGE SET

For oil field, locomotive type and marine boilers. Water shows black — steam shows white; the water level is unmistakable. U-Bolt construction is strongest and simplest to service. Glass replaced by simply removing nuts on face of gage . . . unnecessary to work between gage and boiler. Conforms with A.S.M.E., Federal and State requirements when used for pressures specified by their respective codes.

This is one of the complete line of Penberthy gages that meet every liquid level gage requirement.

PENBERTHY PRODUCTS

PENBERTHY INJECTOR CO.

DETROIT, MICH. Canadian Plant WINDSOR, ONTARIO

Facilitate Tough Floor Cleaning Jobs

FLOOR SANITATION

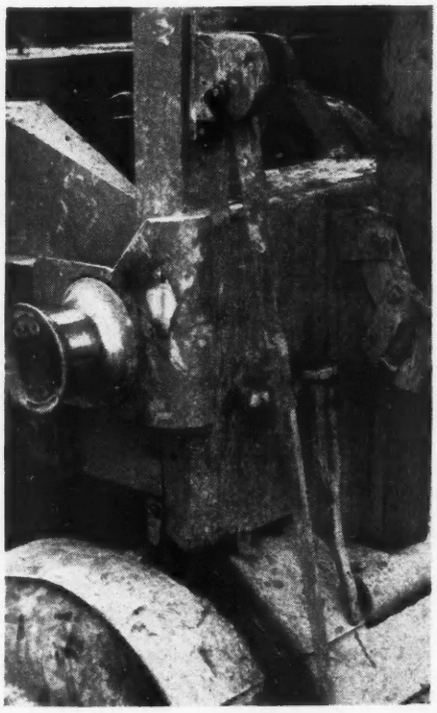
Clearing mud from the floor after running pipe is simply a matter of hosing down if a plentiful supply of water is at hand. But if water must be conserved as much as possible some sort of scraper or drag for removing most of the mud will reduce the washing required and, if necessary, will leave a floor which is dry enough to afford safe footing.

One such squeegee is made at the rig by utilizing the rubber from a used casing protector. The protector is split longitudinally, and the edge of the cut section bevelled so as to form a sharp scraping edge. The back of the rubber slab is then split so as to enable it to be forced over the teeth of an ordinary garden rake.

The scraper is attached to the rake by two or more stove bolts of the proper length through the rubber above the horizontal member of the rake which carries the teeth.

Such a squeegee may be used as a pusher by holding the handle of the rake nearly level, or will serve as a drag if the handle be canted at about 45 degrees and the sharp edge dragged toward the floorman instead of being pushed from him.

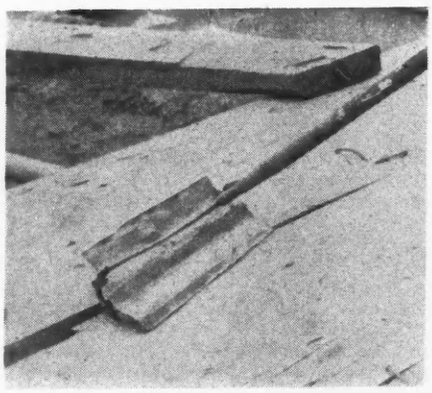
Speed Cable Cutting

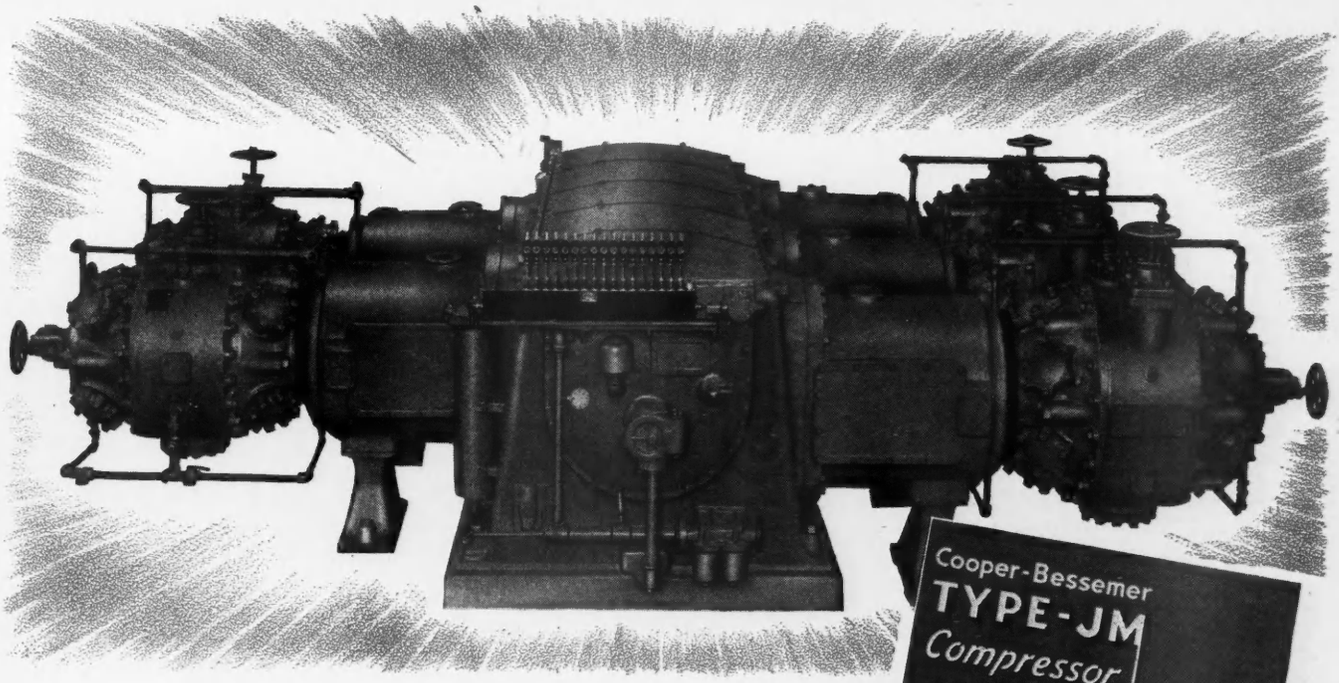


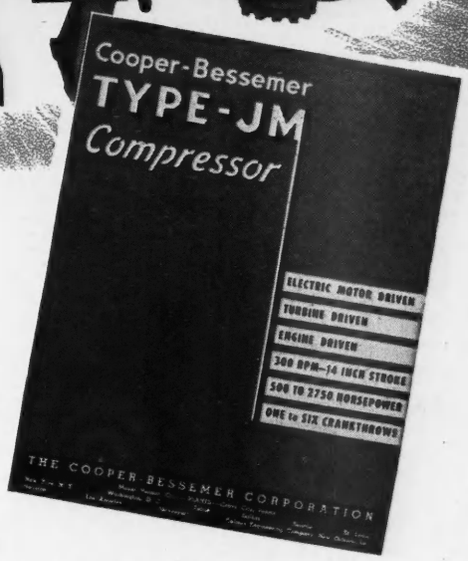
TOOL MOUNTING

A frequently-occurring, and time-consuming job on the average cable tool rig is that of cutting cable, either for re-fitting into rope sockets and pulling new line over the crown sheave. Ordinarily this job consists of laying the cable across an anvil and using a hammer and chisel to sever the rope. One contractor, however, installs a cutting tool vertically on one side of his drilling rig framework.

Mounted at convenient working height above the derrick floor, the cutter has a handle which provides ample leverage, and depending upon the type of job being handled, can be operated by one or two men. Such a tool materially shortens down-time, can be operated wherever and whenever the rig is set up, and takes up little space as compared to the temporary set-ups necessary when doing the work on the derrick floor.







Introducing

A GREAT NEW COMPRESSOR...

This descriptive bulletin gives the facts about the new Type JM Compressor. ASK FOR IT.

THIS new *motor-driven* compressor, latest achievement of Cooper-Bessemer engineering offers remarkable advantages in the 500 to 2750 hp range. For example: tremendous savings in space . . . the flexibility of one to six crank-throws . . . a new conception of maintenance accessibility . . . the extreme durability in which Cooper-Bessemer units have long excelled . . . and a complete range of compressor cylinders, for air or any gas, from low vacuums to highest pressures, all fully proved by years of unsurpassed performance with the popular Cooper-Bessemer Type GMV engine-driven compressors.

Yes, the JM compressor, especially designed for heavy duty motor-driven service, is ready now to give you exceptional efficiency *plus* sensationally low cost in housing, installation, operation and maintenance.

Send for the descriptive bulletin. Get acquainted with the JM compressor and see what these savings can mean to you.

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MOUNT VERNON, OHIO — GROVE CITY, PENNA.

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Parkersburg, W. Va. San Francisco, Calif. Houston, Dallas, Greggton, Pampa and Odessa, Texas
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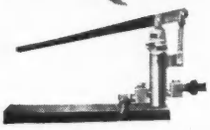
They call me "HANDY ANDY"



I can test pipe and fittings, remove cores, and develop pressures up to 6,000 psi for any and all types of testing. I weigh approximately 68 lbs. on a solid base, but if you don't want to lug me around, then order me with wheels.

I shove around easy!

BAKER hydraulic HAND PUMP

ASK THE BAKER MAN

CASING... COMES OUT EASY!

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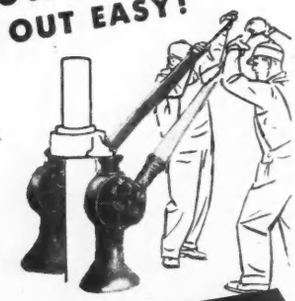

Simplex GEARED JACKS

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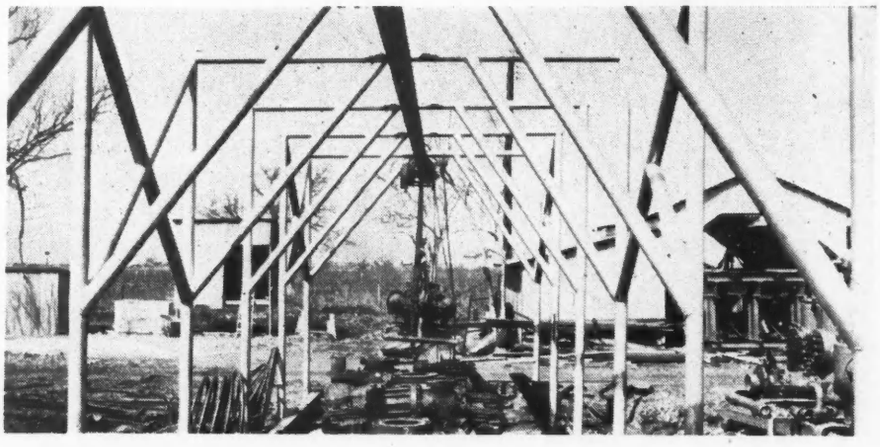
Ease Handling and Storage of Heavy Drilling Equipment



EQUIPMENT HANDLING

The problem of handling heavy items of drilling equipment, such as blow-out preventers, has been solved by one drilling contractor who devised the overhead trolley shown. The concrete platform provides a sturdy base on which to store the heavy pieces, while the overhead track eases the job of loading and unloading these items.

Placed so that the track extends partly over the drive way, the dock is about a hundred feet long to provide ample storage space for idle tools. Here, too, equipment just returned from a job may be washed down and inspected and repaired. Such ease of storage facilitates the location of the proper size blow-out preventer, and speeds up the loading of this equipment on rush orders. In the illustration, one blow-out preventer is suspended by the chain hoist ready to be loaded onto a truck.

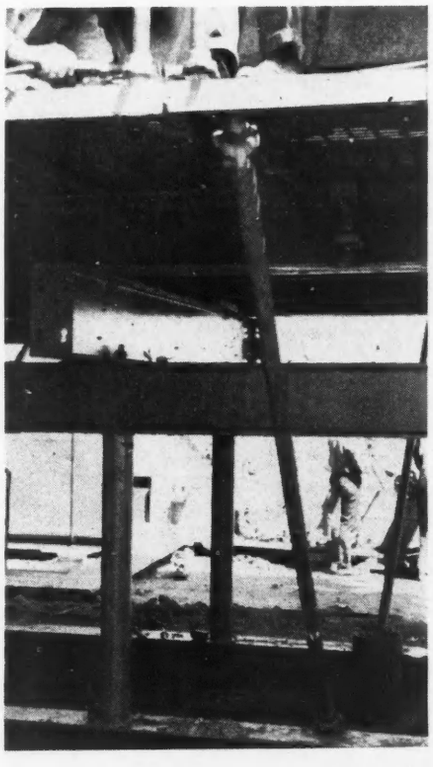
The frame work for the track suspension is of four-inch pipe material, welded in the form of a "U" with two 45-degree angle braces spanning each corner. Each individual frame is set firmly in the reinforced concrete base, and crossed braced between frames on both sides of the base at strategic points. The I-beam track is then suspended from this framework.

Speed Up Installation of Floor and Walkway Supports

RIG FLOOR SUPPORTS

The use of quick-acting pipe unions with which to install railings, braces for walk-ways and other sub-floor supports, is gaining favor among companies attempting to substantially reduce their rigging-up and tearing-down time. Their use permits the standardization of certain length supports or railing sections which can be numbered or otherwise identified and reused many times. Short nipples welded to the sub-structure or flooring members are equipped with one half of the union, and the brace or support fitted with the other half. When rigging up, it is the work of but a minute or two to install the support. Ordinarily, two-inch unions are used for the type of installations shown.

Admittedly, the initial cost of the unions, together with the threading of pipe nipples, is comparatively high. However, when it is realized how many hours of time is saved by eliminating a fitting and welding job for each support, the pro-rated cost of the union-type assemblies is greatly reduced. Savings in materials ordinarily wasted through having to cut and weld at each location also accounts for economy in routine moving operations.



Crude Production Hits Year's High; Refined Products Output Stepped Up

Increased production of crude and all principal refined products in the week ended April 26 was reported by The API. Slackened demand for light fuel oils permitted some production to be added to stocks, while gasoline stocks began to show normal seasonal declines.

Crude production reached a new high for the year with a daily average of 4,930,000 barrels in the week ended April 26. That daily rate was an increase of 18,000 barrels over the previous week's and 258,000 barrels or 5.5 percent over production a year ago.

Daily refinery runs were stepped up 16,000 barrels to average 4,725,000 barrels, which were 50,000 barrels or 1.1 percent over runs a year before. Stocks of refinable crude were boosted to a new three-year high by additions of 2,505,000 barrels, which brought the total to 234,051,000 barrels on April 19, according to the Bureau of Mines. That amount was 12,362,000 barrels or 5.6 percent more than was on hand a year before and was at the highest level since June 3, 1944, when 234,476,000 barrels were reported.

Production of refinery gasoline increased 247,000 barrels to total 14,213,000 barrels for the week, which were 176,000 barrels or 1.3 percent over production in the like week of last year. Stocks of finished and unfinished gasoline were reduced 1,732,000 barrels during the period to 103,860,000 barrels. That total topped last year's amount by 4,540,000 barrels or 4.6 percent.

The week's distillate fuel oil production amounted to 5,435,000 barrels, an increase of 172,000 barrels over the previous week's output and 245,000 barrels less than was produced in the like period of 1946. Stocks of this light burning oil began their buildup by increasing 816,000 barrels to 32,286,000 barrels, which were only 774,000 barrels or 2.5 percent over stocks a year before.

An increase of 225,000 barrels boosted the week's residual fuel production to 8,186,000 barrels, but that amount was 854,000 barrels or 9.4 percent under production of last year's comparable period. Withdrawals totaling 81,000 barrels were made from residual stocks, dipping them to 42,668,000 barrels, a new low mark for this year, but 3,383,000 barrels or 8.6 percent over stocks held a year before.

Stock Exchange

The Standard Oil Company of Ohio will acquire a 3 percent interest in the Barnsdall Oil Company, and a 2 percent interest in the Texas Pacific Coal & Oil Company, in an exchange of stock with two investment trusts, C. T. Foster, vice president and treasurer of Sohio, said. Standard will exchange 93,450 of its $10 par shares for 20,000 shares of $10 par common stock of Texas Pacific and 69,000 shares of $5 common of Barnsdall, while 2625 Sohio shares will be exchanged with Bessemer Securities Corporation for 3000 shares of Barnsdall.

Products Prices Unchanged; Supplies Generally Scarce

Refined products prices were generally unchanged throughout the week as demand for all oils continued at high levels and most areas' supplies remained scarce or closely held. Crude prices were unchanged with the exception of a 10-cent hike for Weber sand production in Colorado's Rangely field.

In the early part of the week a Pennsylvania refiner advanced his prices for Stoddard solvent and distillate fuels .25 cent. His prices are now 9 cents for solvent, 7.75 cents for No. 1 fuel and 7.5 cents for Nos. 2, 3, and 36-40 fuels. Refiners of this area reported gasoline demand still above the level of a year ago, with inventories low and shipments coming from daily production. Some slackening in fuel oil demand was evident in this area, but generally it remained at a good level.

An advance of 10 cents to $1.75 per barrel was made in the No. 6 fuel prices of an Oklahoma refiner during the week. Prices of other refiners in the state ranged from $1.64 to $1.80 per barrel for No. 6. Gasoline demand in the Mid-Continent and Midwestern areas continued to increase steadily and all fuel oils remained critically short as refiners and tank car marketers reported demand continued to far exceed supply.

Although no change in posted prices were reported for the Atlantic Coast, reports continued of premiums being offered for gasoline and Nos. 5 and 6 fuel oils at New York harbor.

An increase of 10 cents a barrel in the postings of the Standard Oil Company of Indiana for crude it purchases in the Rangely field, Colorado, was made during the week. This raise, which became effective at 7 a.m. April 25, placed the same price on this Weber sand crude as that paid in the Mid-Continent area. This crude is 33.5 to 35.5 gravity and prices are now $1.81 to $1.85 per barrel.

Trends of Operations and Changes in Stocks

Figures on crude stocks are from Bureau of Mines weekly reports; all others from American Petroleum Institute weekly reports, which are estimates on Bureau of Mines basis.

(All figures in thousands of barrels—add 000)

HIGHS AND LOWS OF RECENT YEARS

ITEM	Crude Oil Prod.		Runs to Stills		Crude Stocks		Gasoline Stocks		Gasoil and Distillate Stocks		Residual Fuel Oil Stocks	
	Barrels Daily	Week Ended	Barrels Daily	Week Ended	Barrels	Week Ended	Barrels	Week Ended	Barrels	Week Ended	Barrels	Week Ended
High:												
1942	4,337	2- 7	3,961	1- 3	263,208	3-28	[1]109,281	3-14	47,861	11-14	95,857	1- 8
1945	4,944	7-21	[1]5,140	8-18	227,554	10-13	99,012	3-24	45,341	11-17	56,074	1- 6
1946	[1]4,961	6-15	4,968	12-28	229,430	3- 2	105,233	2-16	[1]67,286	11- 9	61,636	11- 2
1947	4,930	4-26	4,986	3-15	234,051	4-19	107,576	3-29	58,034	1- 4	53,285	1- 4
Lows:												
1945	3,621	10- 6	3,409	10- 6	[2]211,813	8-25	70,791	10-13	26,483	3-17	38,548	5-26
1946	4,403	3- 9	4,498	1-12	218,193	1- 5	85,324	9-28	25,131	3- 9	37,289	4- 6
1947	4,531	4-11	4,667	4-12	220,313	2- 8	94,882	1- 4	31,470	4-19	42,668	4-26

TRENDS OF 1946 AND 1947

Trends in Week Ended	Crude Oil			Gasoline		Gasoil and Distillate		Residual Fuel	
	Production Daily	Runs to Stills Daily	Stocks Week End	Production Weekly	Stocks Week End	Production Weekly	Stocks Week End	Production Weekly	Stocks Week End
1946:									
January 5	4,548	4,651	218,193	14,488	98,494	5,923	35,199	8,867	42,371
January 26	4,626	4,553	220,544	13,622	101,737	5,720	29,498	8,411	39,722
February 23	4,714	4,595	226,699	13,175	104,709	5,728	25,398	7,913	39,290
March 30	4,425	4,684	224,994	13,896	104,715	5,337	28,240	8,738	37,746
April 27	4,672	4,685	224,443	14,228	99,631	5,568	30,466	9,204	39,404
May 25	4,759	4,857	222,214	14,312	95,769	5,463	32,973	8,908	43,368
June 29	4,957	4,854	223,883	14,500	92,333	5,325	37,762	8,828	46,477
July 27	4,926	4,896	223,756	14,535	88,626	5,817	44,316	8,217	49,517
August 31	4,833	4,911	227,132	15,014	87,217	5,630	53,134	8,539	53,173
September 28	4,778	4,829	223,043	14,675	85,324	5,632	59,827	8,172	57,657
October 26	4,730	4,758	221,184	14,863	86,423	5,710	65,499	7,728	60,872
November 30	4,795	4,707	227,693	15,145	88,371	5,258	66,062	7,672	58,647
December 28	4,713	4,968	225,995	15,604	93,126	5,931	58,941	8,181	53,427
1947:									
January 4	4,649	4,917	223,291	15,281	94,882	5,857	58,034	8,375	53,285
January 25	4,672	4,820	221,655	14,624	99,801	5,630	50,357	8,224	48,558
February 22	4,786	4,860	224,580	14,668	103,904	5,929	40,739	8,542	44,919
March 29	4,865	4,843	227,529	14,396	107,576	5,969	32,737	8,668	43,364
April 5	4,892	4,772	230,401	14,374	106,966	5,653	32,358	8,206	43,541
April 12	4,913	4,667	231,546	14,090	106,221	5,499	32,019	8,232	42,946
April 19	4,912	4,709	234,051	13,966	105,592	5,263	31,470	7,961	42,749
April 26, 1947	**4,930**	**4,725**	.....	**14,213**	**103,860**	**5,435**	**32,286**	**8,186**	**42,668**
April 27, 1946	4,672	4,675	[3]221,689	14,037	99,320	5,680	31,512	9,040	39,285
Change:									
In Week	+18	+16	+2,505	+247	—1,732	+172	+816	+225	—81
In Year	+258	+50	+12,362	+176	+4,540	—245	+774	—854	+3,383
In Year	+5.5%	+1.1%	+5.6%	+1.3%	+4.6%	—4.3%	+2.5%	—9.4%	+8.6%

[1] All time peak. [2] Lowest since December, 1921. [3] Stocks, April 20, 1946.

• Oklahoma

Wildcat in McClain County Tested in Pennsylvanian

Closely-watched McClain County wildcat to take drill-stem test in Pennsylvanian formation; Carter's wildcat which may connect 2 important pools has stuck drill pipe; extensioner for East Lindsay area fishing for lost tools; Mid-Continent's test near North Elmore field flows gas and oil on test; wildcat north of Katie pool to be deepened following unsuccessful drill-stem test; Amerada's Sledge 11 in Stephens County blowing wild; Wayne sector apparently extended westward; Tillman County prospect gets show of oil; new zone apparently opened in Witcher field.

McClain County: Drill-stem testing of the Pennsylvanian formation probably will begin at Magnolia Petroleum Company's Myers 1, SW SE 35-8n-3w, about 2½ miles northeast of the Washington pool. A core from 8187-96 feet recovered light oil staining. The Pennsylvanian was topped at 7893 feet. The wildcat is between the Washington pool and the old West Noble pool, and is approximately 5 miles directly east of the Blue Hill pool, opened by Skelly Oil Company in 1946.

Garvin County: The Carter Oil Company's Helvy 1, SE NW 25-2n-2w, the wildcat which many geologists feel will connect the Katie and the Northeast Elmore pools, on a shoreline trend, has stuck drill pipe at 6421 feet in the Deese sand. The test topped the Deese at 6159 feet, and a few hundred feet should bring the Gibson sand, which is the main pay in both the Katie and the Northeast Elmore fields.

The East Lindsay pool has been successfully extended by Max Pray and R. L. Bauman, with Myers 1, CNW NW 7-4n-3w, approximately a mile southwest. The well flowed an estimated 76 barrels of oil on test of the Bromide from 9824-60 feet. Crew was fishing for lost perforating gun before completing. Total depth is 10,188 feet.

The Northeast Elmore field may receive a ½-mile northwest extension at Mid-Continent Petroleum Corporation's Vandiver 1, SE SW NW 14-2n-2w. The well was flowing oil and gas, from the Gibson sand, main pay in the field, which was topped at 6487 feet. A drill-stem test from 6487-529 feet showed an estimated 500,000 cubic feet of gas a day. No estimate has been made on the oil flow, which was through perforations in the Gibson. The company's Ellis 1, NW NW SE 32-3n-2w, may extend the Southwest Antioch field approximately ½-mile southeast. On a drill-stem test in the Gibson, topped at 6578 feet, an estimated 3 million cubic feet of gas was recovered, and oil showed in 7 minutes. The test was made from 6580-99 feet, total depth.

Another important test in the general area between the Katie and Northeast Elmore pools is Magnolia's Walston 1, SW NW 29-2n-1w, which is about 1½ miles northeast of Carter's Helvy 1. The test has been drilled to the Chimney Hills section of the Hunton lime, with no apparent shows, and will be deepened. The Chimney Hills was perforated from 6430-50 feet after a treatment with 2000 gallons of acid.

Stephens County: Amerada Petroleum Corporation's Sledge 11, NE NE SE 19-1s-5w, in the West Velma pool, continued to blow out of control. The well blew out at 2680 feet in the third Deese sand, and its estimated blow has been set at 175 million cubic feet of gas daily. Deese was topped at 1810: First Deese at 1954; Second Deese at 2190, and Third Deese at 2633 feet.

Southwest Wayne area: A 1-mile west extension on the northwest side of the Southwest Wayne area of McClain County has been added by Dearing, Inc., and O. L. Ledgerwood. Howard 1, CNW NW 25-5n-2w, flowed oil from the Hunton lime (Bois d'Arc section) from 7140-45 feet. Total depth is 7200 feet, with 7-inch casing set at 7150 feet. Flow was estimated at 38 barrels in 30 minutes. It has been shut in for tanks. No tubing is in the hole and the well has not been acidized.

Tillman County: A shallow oil pool appears likely at W. C. Estes' Riggs 1, NE NE SE 11-1n-18w. The well was deepened to 993 feet from a previous depth of 893 feet, and free oil was recovered in the granite wash, from 960-985 feet.

Oklahoma County: A new producing zone in the new Witcher gas field apparently was being opened by the Skelly Oil Company's Adams 1, CSW SE 20-13n-2w. On a drill-stem test at 6127-70 feet the well showed an estimated 4 million cubic feet of gas, believed coming from the Bois d'Arc section of the Hunton lime. Other production is from the Bartlesville sand. The Skelly well is about ½ mile south of the Peppers Refining Company and Ace Gutowsky's Martin well, discovery of the field, with gas-distillate production.

Warren Buys Building

Warren Petroleum Corporation, Tulsa, has purchased from American Airlines, Inc., the seven-story American Airlines stewardess training center in downtown Tulsa. The building, formerly the Bradford hotel before American purchased it last fall, will be remodeled by the Warren Employes Pension Trust of the corporation, into a modern air-conditioned office structure. Consideration of the sale was approximately $400,000. Warren Petroleum Corporation announced it would use none of the space, as it plans to remain in the National Bank of Tulsa building.

Wells Completed in the United States in Week Ended April 26, 1947

Data preliminary and subject to revision. Revised and more complete data on all completions and exploration shown in monthly summaries published in last issue of each month.

State or District	FIELD COMPLETIONS: New Wells: Oil	Dist.	Gas	*Input	Dry	Total	Old Wells Deepened	EXPLORATORY COMPLETIONS: Oil	Dist.	Gas	Dry	Total	ALL COMPLETIONS: This Week	Last Week	This Week 1946
Alabama	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...
Arkansas	2	...	...	...	2	4	...	...	...	...	...	...	4	5	5
California	35	...	...	...	3	38	...	...	...	...	5	5	43	32	33
Colorado	2	...	...	...	...	2	...	...	...	...	...	...	2	1	6
Florida	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
Illinois	14	...	...	...	7	21	...	1	...	...	3	4	25	28	37
Indiana	3	...	...	...	2	5	...	1	...	...	1	2	7	14	7
Kansas	13	...	10	...	10	33	1	...	...	...	4	4	38	49	36
Kentucky	5	...	1	...	1	7	...	1	...	...	1	2	9	8	14
Louisiana	13	...	...	...	10	23	...	...	...	...	4	4	27	19	29
N. Louisiana	6	...	...	...	6	12	...	...	...	...	2	2	14	10	13
S. Louisiana	7	...	...	...	4	11	...	...	...	...	2	2	13	9	16
Michigan	2	...	...	...	...	2	...	1	...	...	6	7	9	4	10
Mississippi	8	...	...	...	...	8	...	...	...	...	1	1	9	6	4
Missouri	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2
Montana	2	...	...	...	...	2	...	...	...	...	...	...	2	3	2
New Mexico	6	...	1	...	1	8	...	...	...	1	1	2	10	16	6
New York	15	...	...	10	...	25	...	...	...	...	...	...	25	26	25
Ohio	5	...	11	...	5	21	...	...	...	...	1	1	22	26	10
Oklahoma	27	...	...	1	17	45	2	1	...	...	10	11	58	68	33
Pennsylvania	27	...	5	15	...	47	1	...	...	...	...	...	48	46	45
Texas	84	...	1	1	25	111	9	8	...	...	37	45	165	184	153
Districts:															
1—S. Central	4	...	...	...	1	5	1	...	...	...	2	2	8	8	4
2—Middle Gulf	6	...	...	...	2	8	1	1	...	...	4	5	14	11	[1]
3—Upper Gulf	8	...	...	...	4	12	...	2	...	...	3	5	17	11	9
4—L. Gulf-S.W.	11	...	1	...	2	14	1	2	...	...	6	8	23	17	28
5—E. Central	5	...	...	...	...	5	...	2	...	...	3	5	10	5	[2]
6—Northeast	...	...	...	...	...	...	1	...	...	...	1	1	2	4	13
7-B—N. Central	3	...	...	...	4	7	...	...	...	...	6	6	13	15	[3]
7-C—W. Central	2	...	...	...	...	2	...	...	...	...	1	1	3	7	[4]
8—West	25	...	...	...	4	29	2	...	...	...	3	3	34	45	42
9—North	16	...	...	1	8	25	3	1	...	...	8	9	37	57	52
10—Panhandle	4	...	...	...	...	4	...	...	...	...	...	...	4	4	5
Utah	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...
West Virginia	3	...	9	...	...	12	2	...	...	...	...	...	14	14	15
Wyoming	2	...	1	...	1	4	...	1	...	...	1	2	6	5	6
Total U. S.	268	...	39	27	84	418	15	14	...	1	75	90	523	556	479

* Includes salt water disposal wells. [1] Middle Gulf included with Lower Gulf-S.W. [2] East Central included with Northeast. [3] N. Central included with North. [4] West Central included with West.

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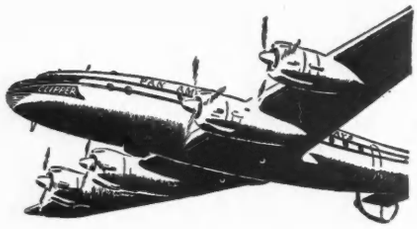

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Terry Discovery Confirms Favorable San Andres Tests

Terry County discovery completing from 75 feet of San Andres saturation; prospective Ellenburger discovery in Winkler County may establish new producing, depth-record for Permian Basin; major extension given Devonian sector of the TXL field; production test pending on important sweet crude strike in Crane County.

Terry County: Amerada Petroleum Corporation's Adair 1, C SW SW PSL 4, Block C-37, confirmed favorable drill-stem tests of San Andres saturation in swabbing 256 barrels of 33-gravity oil on 15¼-hour test after acidizing perforations at 4850-925 feet with 3500 gallons. Treatment with 6000 gallons of acid was scheduled to try for a steady flow. This wildcat is 6½ miles north by west of the Cedar Lake field, nearest production. The San Andres was entered at 4400 feet, with elevation 3220 feet. Amerada is starting Elkins 1 as a west offset. Stanolind Oil & Gas Company will provide a market outlet, using tank trucks until a line is built into the area.

Winkler County: Amon G. Carter's Wight-Gulf 1, C SW SW PSL 29, Block 40, 2⅞ miles southeast of a recent 11,980-foot failure and lower structurally on all markers below the Permian, landed 5½-inch casing on top of Ellenburger at 12,265 feet to try for production from open hole at 12,359 feet. Two drill-stem tests yielded a small amount of free oil without water. A successful completion would give the Permian Basin a new producing depth record. This prospective wildcat discovery correlates progressively low from base of Permian to the Silurian, then regained structural position to check only 371 feet low on the Ellenburger. Interest in the general area is due to numerous short-term leases.

Crockett County: Cities Service Oil Company et al's Owen's 1-B wildcat between the Clara Couch and Olson shallow fields and capable of prolific oil and gas flow near the Permian-Pennsylvanian contact, eliminated the Ellenburger as a prospective source of production in developing 4000 feet of salt water at 6780-6820 feet after drilling plugs from casing at 6770 feet. No test was made before setting pipe for fear of another blowout from the Crinoidal, topped at 5616 feet with elevation of 2410 feet. Humble Oil & Refining Company and Plymouth Oil Company each has one-third interest in the well, and the latter is starting north and east offsets.

Crane County: Gulf Oil Corporation's University 1-HH, SW NE Sect. 3, Block 31, outstanding discovery for the district since the entry of the TXL multi-pay field, was drilling plugs from 7-inch casing at 10,947 feet, or 3 feet off bottom, to test through open hole. The bottom 50 feet of the 362-foot section of Ellenburger was not drill-stem tested. If no water appears during the pending test the well will be deepened 100 to 150 feet, or until the water table is established. The area has been designated as the University-Waddell field, and will be developed as rapidly as pipe supplies will permit, with Gulf starting northeast and southeast outposts. The discovery logged 4 prospective oil pays below the Permian before scoring prolific oil flow from the Ellenburger, the prime objective.

The Texas Company's Connell 31, wildcat near the north line of the county, was drilling at 7630 feet in Devonian, topped at 7360 feet, with nominal oil and gas shows but lacking in porosity. This marker correlates 371 feet low to the Ellenburger discovery for the nearby Jordan field, and 572 feet high to a failure 2½ miles southwest.

Andrews County: Fullerton Oil Company's Wilson 124, west offset to its discovery for the Fullerton field, established first production from the Wolfcamp in pumping 156 barrels of oil and 68 barrels of water initial after acidizing perforations at 8098-135 feet. It was slated to try for a northwest extension for the Ellenburger producing area, but was plugged back at 9235 feet due to checking low.

Reagan County: Danciger Oil & Refineries, Inc.'s University Carter 1, C NW SE Sect. 8, Block 48, extended the Barnhart field ½-mile south and registered high structural position in flowing 840 barrels of 47.2-gravity sweet crude initial through 20/64-inch choke after using 4000 gallons of acid through perforations at 9124-64 feet. Production is from Ellenburger, topped at 8954 feet, with elevation 2735 feet, or 19 feet high to nearest producer. Danciger obtained this 307-acre lease and other tracts from Amon G. Carter, and is starting a west offset, while Amerada will drill a north offset to the producer.

Ector County: Shell Oil Company's Cochran 1-A, C NE SE T&P 34, Block 46, and ⅝-mile west by north of an Ellenburger failure that has resulted in cautious operations on the north end of the TXL field, has set pipe at 7941 feet to complete after drilling 190 feet of broken Devonian pay to 8150 feet. This outpost is 1½ miles north of nearest Devonion production and probably will result in the drilling of about 20 additional Devonian producers. The failure is on the dividing line between Devonian and Ellenburger producers. Irregular well spacing was adopted in the field proper by some operators to avoid the narrow barren strip.

Gulf's Goldsmith 421-D, Devonian pay discovery for the Goldsmith field, flowed 128 barrels of 38.5-gravity oil and 163 barrels of water, with gas-oil ratio 676/1, on initial gauge through ½-inch choke from perforations at 7980-90 feet. It was drilled to 9811 feet in Ellenburger, topped at 9685 feet. Gulf has spudded Goldsmith 430-E, situated ⅝-mile northwest to explore the Ellenburger.

Humble's Yarbrough-Allen 1, C NW NE PSL 18, Block B-14, Ellenburger prospect for the southwest part of the county, confirmed its high structural position for the area on Permian markers in recovering 120 feet of slightly oil- and gas-cut mud at 7434-510 feet, and was drilling at 7570 feet.

Property Sold

Bay Petroleum Corporation acquired its first important production in North Texas through the purchase of Wayne H. Hammon's ½ interest in five leases in the Madden field, Wichita County, for $1½ million cash. The remaining interest is owned by Warren Petroleum Corporation. The properties involve 27 wells, including two Ellenburger producers with an allowable of 1200 barrels daily.

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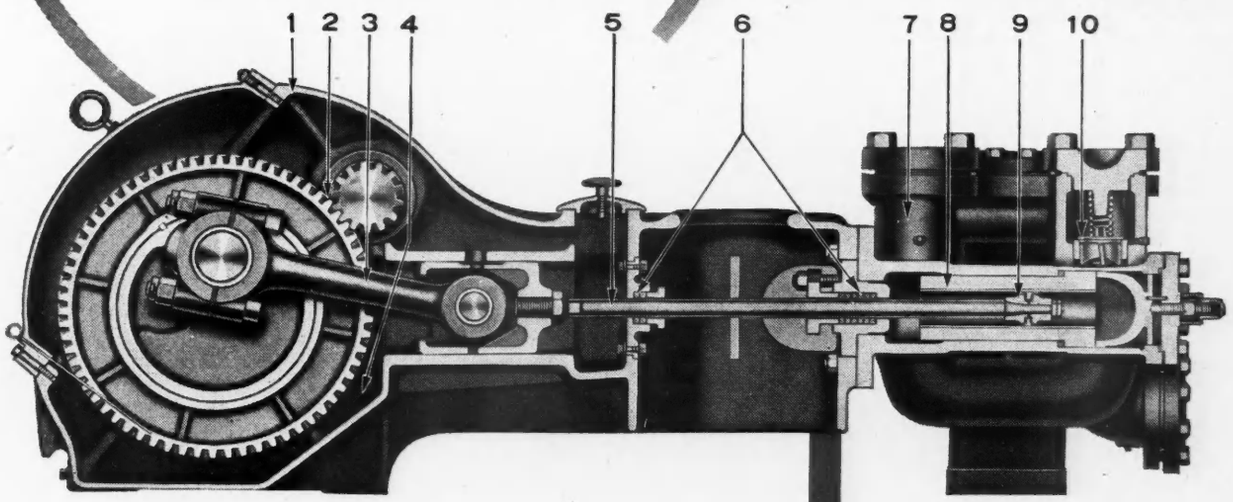

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Fisher County Test, Royston Area, Is Showing for Test

Fisher County semi-wildcat shows for pumper; new Ranger lime strike made in Callahan County.

Fisher County: Texas Pacific Coal & Oil Company's Young 1-A, SE SE SW Sect. 3, W. E. Kaye Survey, and 1 1/16 miles northwest of an abandoned pumper on the north end of the Royston field, swabbed 1½ barrels of oil hourly from saturated lime at 3113-15 feet, with 5½-inch casing at 3107 feet. Acid treatment was pending.

Callahan County: E. J. Ruwaldt's L. L. Howser 1, Jesse Dyson Survey 751, and 1¾ miles northeast of production in the Cross Plains townsite, opened a Ranger lime field in pumping 48 barrels initial after acidizing perforations at 3350-68 feet. This wildcat was plugged back from 3862 feet in Ellenburger, topped at 3749 feet, with elevation 1756 feet. Ruwaldt donated the well along with 100-acre site in fee to the Sacred Heart Catholic Church of San Angelo, Texas.

Standard Oil Company of Kansas' Murphy 1, G. G. Spottswood Survey and 3½ miles north by west of the Baum-Ellenburger field, entered barren Ellenburger at 4016 feet, and was abandoned in Hickory water sand at 5118 feet.

Jones County: Condor Petroleum Company's Sayles 44, offsetting shallow production in the Sayles field, tested water in the Bend, topped at 4624 feet, with elevation 1654 feet, and also reached water in drilling Ellenburger to 5080 feet. The well will be plugged back for retest of oil show in the 3800-foot Strawn.

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California Oil Producers Agency Reelects W. C. Whaley

W. C. Whaley, vice president of Barnsdall Oil Company and general manager of its California operations, was reelected president of Oil Producers Agency of California.

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Wilbarger County: Humble Oil & Refining Company's McCaleb 6, SE NE H&TC Ry. 34, Block 15, proved Ellenburger production for the north end of the Fargo field, which also produces from the Cisco, Canyon and Strawn, and was running pipe to complete from 97 feet of the dolomite. The Ellenburger was entered at 6248 feet, with elevation at 1388 feet, and a drill-stem test at 6250-345 feet yielded gas to the surface within 11 minutes and flow of oil in 26 minutes at a rate of more than 200 barrels per hour. This strike is ½ mile northwest of Amerada Petroleum Corporation's Good Pasture 1, field discovery that completed in the shallowest oil zone after swabbing 15 barrels of 41.5-gravity oil hourly from effective pay section at 6306-30 feet in Ellenburger, topped at 6301 feet, or 49 feet low to McCaleb 6. Amerada's discovery established the Ellenburger water table at 6353 feet, with elevation of 1392 feet.

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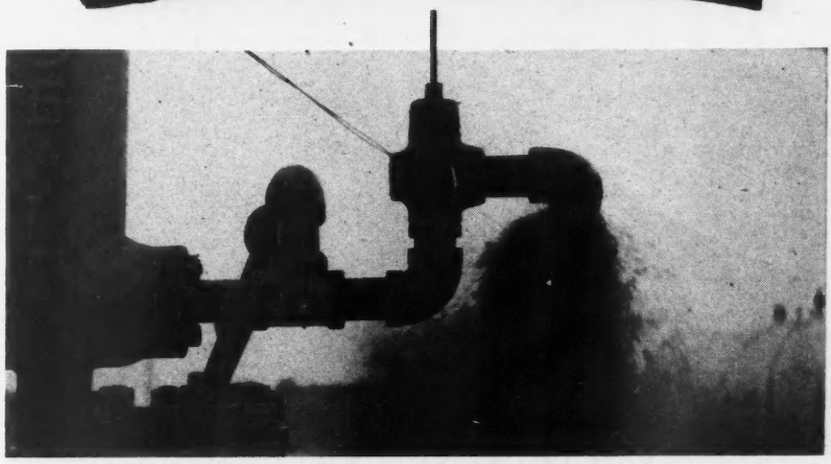

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• West Central Texas

Fisher County Test, Royston Area, Is Showing for Test

Fisher County semi-wildcat shows for pumper; new Ranger lime strike made in Callahan County.

Fisher County: Texas Pacific Coal & Oil Company's Young 1-A, SE SE SW Sect. 3, W. E. Kaye Survey, and 1 1/16 miles northwest of an abandoned pumper on the north end of the Royston field, swabbed 1½ barrels of oil hourly from saturated lime at 3113-15 feet, with 5½-inch casing at 3107 feet. Acid treatment was pending.

Callahan County: E. J. Ruwaldt's L. L. Howser 1, Jesse Dyson Survey 751, and 1¾ miles northeast of production in the Cross Plains townsite, opened a Ranger lime field in pumping 48 barrels initial after acidizing perforations at 3350-68 feet. This wildcat was plugged back from 3862 feet in Ellenburger, topped at 3749 feet, with elevation 1756 feet. Ruwaldt donated the well along with 100-acre site in fee to the Sacred Heart Catholic Church of San Angelo, Texas.

Standard Oil Company of Kansas' Murphy 1, G. G. Spottswood Survey and 3½ miles north by west of the Baum-Ellenburger field, entered barren Ellenburger at 4016 feet, and was abandoned in Hickory water sand at 5118 feet.

Jones County: Condor Petroleum Company's Sayles 44, offsetting shallow production in the Sayles field, tested water in the Bend, topped at 4624 feet, with elevation 1654 feet, and also reached water in drilling Ellenburger to 5080 feet. The well will be plugged back for retest of oil show in the 3800-foot Strawn.

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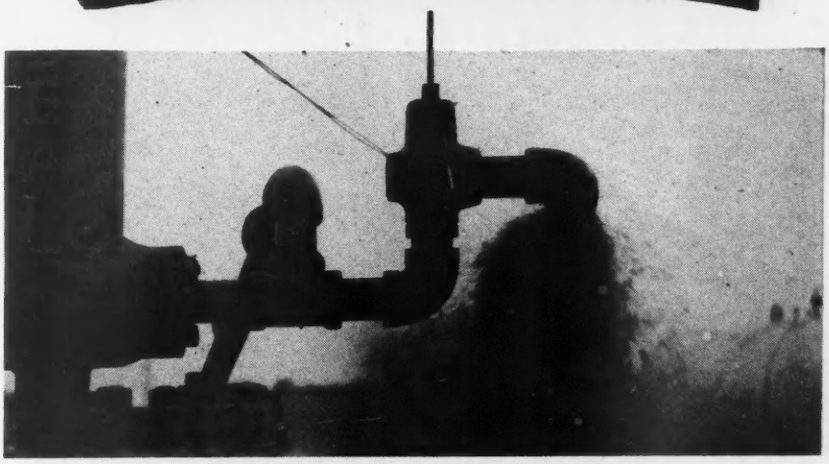

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Gary 1, east offset to the producer, was drilling at 5740 feet, having entered the Woodbine at 5135 feet with elevation of 448 feet.

Houston County: Magnolia Petroleum Company's Grounds 1, wildcat 6 miles southeast of Grapeland, was coring for possible porosity in the top section of the Glen Rose. Massive anhydrite was logged at 10,100-10 feet.

Marion County: Magnolia Petroleum Company's Hall Estate 1, M. W. Moody Survey, Lassater field deep test, plugged back again to 7880 feet when a 25-minute drill-stem test of lower Travis Peak perforation from 7995-8010 feet recovered 450 feet of water and muddy water with a slightly salty taste. Though the well has had shows of distillate in lower intervals, salt water encroachment has necessitated a series of plug-backs.

• South Central Texas

Atascosa County's Weigang Field Given New Producer

New producer finaled at Weigang; outpost at Charlotte shows oil and gas on drill-stem test; casing being set in Guadalupe wildcat.

Atascosa County: H. R. Smith et al's A. O. Schumann 7, Weigang field and 660 feet northeast of the No. 5 well, has been completed. The well flowed 93 barrels of 24.5-gravity oil daily through 9/64-inch choke with tubing pressure of 190 pounds and gas-oil of 55/1. Total depth is 3818 feet with 7-inch casing set on bottom and perforated at 3796-3804 feet for completion.

Humble Oil & Refining Company's Eppright 1, located ½ mile northwest of the Henry 1 northeast extension at Charlotte field, is drilling below 6166 feet in sandy shale after making 2 drill-stem tests. Thirty feet of gas-cut mud was recovered on drill-stem test at 5275-90 feet in the Navarro sand and 150 feet of gas-cut mud with slight show of oil was recovered at 5290-5325 feet.

Guadalupe County: Weigand Brothers were preparing to set casing in the Pat H. Baker 1, wildcat 5 miles southeast of Kingsbury in U. Wakefield and C. B. Stewart Survey. Total depth is 2540 feet.

Tunnels May Be Employed in Long Beach Harbor Drilling

Development of the oil field believed to underlie the eastern part of Long Beach (Calif.) harbor by a system of underwater caissons or tunnels appears likely as a result of action by the city council in voting down island drilling. A report by the city manager advised against island drilling because of the difficulty of obtaining Army and Navy consent and also because of the high cost.

Under the proposed plan, the drilling would be from tunnels at a depth of 600 feet, extending as far as 2000 feet out under the ocean floor. A large cavernous area would be excavated at each drill site which would be connected with the mainland by tunnels. The city will ask for bids from oil companies interested in undertaking the development.

The city recently leased 278 acres of submerged land in the harbor to Richfield Oil Corporation at a very high royalty but drilling will be from an existing pier extending out into the ocean.

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• Southwest Texas—Lower Coast

Willacy County Test Seeks Record Depth Production

Yturria wildcat in Willacy County to test deep sands; wildcat south of San Salvador shows for gas-condensate production; South Haldeman well completed in new deeper sand; new sand in Agua Dulce north extension area shows for production.

Willacy County: The Texas Company is under reaming 5-inch liner at Yturria Land & Livestock 6, deep wildcat 8 miles northeast of Raymondville, and may set 4-inch liner to total depth of 16,006 feet. Five-inch liner was previously set to 14,490 feet. This wildcat tried to blow out at total depth but the well was controlled and electrical log run. If production is secured below the 5-inch liner this well will become the world's deepest producer. The record is now held by a recently completed well at Weeks Island field, South Louisiana, that produces about 125 feet short of 14,000 feet. The sand to be tested in the Yturria 6 is just above the 16,000-foot level.

Hidalgo County: Magnolia Petroleum Company's Santa Cruz Farms 1, wildcat 1¼ miles south of San Salvador field, has shown as a gas-condensate discovery. From perforations at 7672-82 feet the well developed 2250 pounds working pressure in 1 hour, using ¼-inch choke, and recovered 50 feet of condensate and 160 feet of condensate-cut mud. These perforations were squeezed for another test to be made lower in the hole at 8270-80 feet. Total depth is 11,003 feet with 7-inch casing set to 9400 feet.

Jim Wells County: Magnolia's Seeligson Unit 4, extension test 1320 feet north of the Clarke 1 discovery at South Haldeman field, has been given potential. The well flowed at the rate of 52 barrels of oil daily through ⅛-inch choke with gas-oil ratio 540/1 and tubing pressure 275 pounds. This well was completed from perforations at 5563-71 feet in a new deep pay zone about 1000 feet deeper than the discovery pay in this area.

Nueces County: Puenticitas Oil Company's M. G. Perry 1, in the north extension area of Agua Dulce field and 1350 feet east of Midstate Oil Corporation's Countiss 1, has indicated oil production from a new pay sand. A drill-stem test at 6820-24 feet in the Lockhart sand, with 900 feet of water cushion, developed 205 pounds working pressure and recovered 1500 feet of oil in 15 minutes. Total depth is 6824 feet with 5½-inch casing set to 6824 feet for completion.

• Middle Texas Coast

Second Well in New Roche Field Is Good Producer

Second well in new Roche field is good producer; deep pay discovered at Bonnie View; potential flow taken at Amerada's new Bloomington discovery; Casing set in Mission Valley wildcat; Karnes County discovery being completed as gas-condensate well.

Refugio County: Second well to be completed in the new Roche field was Hewit & Dougherty's Kathleen D.

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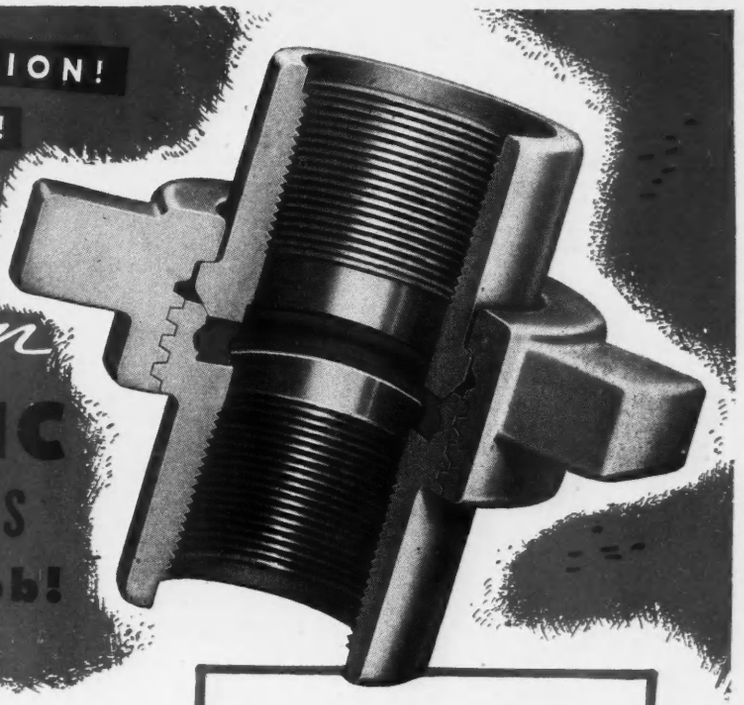

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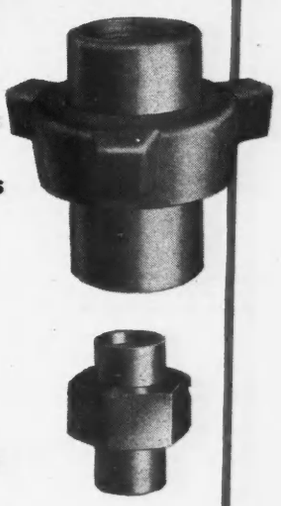

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Roche 2-A, located 933 feet northeast of the Roche 1-A discovery. On potential the well flowed 152 barrels of 38.4-gravity oil daily on ⅛-inch choke with gas-oil ratio 659/1. Tubing pressure was 1050 pounds and casing pressure 1250 pounds. Total depth is 7965 feet with 4½-inch drill pipe (the well tried to blow out while drilling at total depth) cemented on bottom and completion is from perforations at 6818-22 feet in the drill pipe. This well is in Atkins & O'Neil Subdivision, D. J. Mitchell Survey, approximately 4 miles southwest of Woodsboro.

Rutherford Drilling Company's Henry Schirmer 12 has tested a deep oil pay at Bonnie View field. A drill-stem test at 6183-87 feet in 8 minutes developed 90 pounds working pressure and recovered 900 feet of oil. A condensate sand at 5626-31 feet was drill-stem tested and in six minutes recovered the 950-foot water cushion cut with gas and condensate. Regular producing sand for the field is the Greta sand at 4500-600 feet. Total depth is 6518 feet with 5½-inch casing set to 6455 feet.

Victoria County: Potential flow of Amerada Petroleum Company's Alexander Unit 1, discovery of the Bloomington field, has been made. The well flowed 157 barrels of 22.3-gravity oil daily through 5/32-inch choke with 675 pounds tubing pressure. Total depth is 6921 feet with 5½-inch casing set to 4973 feet and perforated at 4904-09 feet for completion.

Amerada has set casing in Elizabeth Mueller 1, wildcat 5 miles west of Nursery and 3 miles southeast of Mission Valley. Total depth is 9916 feet with 5½-inch casing set on bottom and perforated in the Wilcox, topped at 8730 feet, for production tests. Details of the tests have not been released.

Karnes County: W. E. Kinnear's Dittmer 1, wildcat 1½ miles east-northeast of Runge field, was being completed as a gas-condensate well. A drill-stem test of perforations at 6760-69 feet flowed gas and condensate on ¼-inch choke with 1600 pounds working pressure and on 7/64-inch choke flowed at the rate of 830,000 cubic feet of gas daily with 2450 pounds working pressure. When tool was pulled 90 feet of mud, 180 feet of condensate, and 360 feet of condensate cut with brackish water were recovered. Total depth is 8180 feet with 5½-inch casing set to 7006 feet.

Delta AIME to Meet

A program centering on petroleum engineering education is scheduled for the May 6 meeting of the Delta Section, AIME, in New Orleans. Papers on petroleum engineering subjects will be given by four Louisiana State University students and the best three will be awarded prizes. B. C. Craft, LSU professor, will discuss "The Present Status of Petroleum Engineering education."

• Upper Texas Coast

Gas-Condensate Sand Tapped In Scoby Discovery Area

Deep gas-condensate sand discovered in Scoby Lake discovery area; producer completed at Chocolate Bayou; ½ mile southeast flank extension at Manvel dome finaled; gas tested in Hockley dome prospect; gas field discovered in Wharton County.

Brazoria County: McCarthy Oil & Gas Corporation's T. A. Munson et al 1 has discovered a deep gas and condensate producing sand at the Scoby Lake discovery area, 1½ miles south of Blue Lake field production. On potential the well flowed 4,620,000 cubic feet of gas and 44 barrels of 50.2-gravity condensate daily through ¼-inch choke. Production is from perforations at 10,488-504 feet and open flow production was estimated at 21½ million cubic feet of gas daily. This well is 5400 feet northwest of Mary B. Nickell 1 discovery, completed in December from perforations at 9100-10 feet for an estimated 3½ million cubic feet of gas and 75 barrels of condensate daily.

Phillips Petroleum Company has completed F. M. Kitchen et al 1 as a producer at Chocolate Bayou field. On potential the well flowed 230 barrels of 41-gravity oil daily through 5/32-inch choke with flowing pressure 2300 pounds and gas-oil ratio 1924/1. Total depth is 9583 feet with 5½-inch casing set to 8945 feet and perforated at 8688-99 feet for completion.

Progress Petroleum Corporation's O. L. Rash et al 1, ½ mile extension on the southeast flank of Manvel dome, has been completed. On potential the well flowed 134 barrels of 26-gravity oil daily through ⅛-inch choke with 500 pounds flowing pressure on the tubing, 900 pounds casing pressure and gas-oil ratio of 235/1. Total depth is 5640 feet with 5½-inch casing set to 4644 feet and perforated at 4590-94 feet for completion.

Harris County: Magnolia Petroleum Company's Warren Ranch 5, located 460 feet northwest of the No. 2 discovery well at Hockley dome, has tested gas from a shallow horizon. Using ¼-inch and ⅛-inch chokes, the 9⅝-inch casing set on bottom of sidetracked hole at 3718 feet was drill-stem tested at 2890-97 feet and in 15 minutes flowed dry gas with 170 pounds pressure. This well is to be deepened to 9000 feet.

Wharton County: Floyd L. Karsten completed C. L. Tucker 1, as a gas discovery 3 miles southeast of El Campo townsite and 3½ miles west of Withers field. This well is a reworked dry hole drilled by Salt Dome Oil Corporation early in 1946 and drilled to 7352 feet. Karsten took it over and drilled out to 7178 feet where 5½-inch casing was set and perforated at 7081-86 feet. There the well flowed gas and condensate with 2750 pounds pressure. Estimats have put production at 30 million cubic feet of gas daily on open flow.

• South Louisiana

Gulf Runs Production String In Bayou Boullion Wildcat

Production string run in Gulf's Bayou Boullion area wildcat; Magnolia prepares for operations at second Gulf of Mexico wildcat; casing set in wildcat north of Houma field; Humble abandons Pecan Island north outpost; Falcon Seaboard et al ready to start Bayou Platten wildcat.

Iberville Parish: Gulf Refining Company's A. M. Cotton et al 1-A, wildcat 2 miles southeast of Bayou Boullion field in 49-9s-2w, has 5½-inch casing set to 10,522 feet and was expected to make

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production tests soon. Total depth of the hole is 11,876 feet in an Oligocene sand. The test is being drilled with a Nickles Drilling Company rig.

St. Mary Parish: Operations will start soon on Magnolia Petroleum Company's State 1, lease 684, second exploration to be drilled in the Gulf of Mexico by the company. Piling and drilling platform have been completed and crews were loading material on barges to commence preparations for operation.

Terrebonne Parish: Union Oil Company of California's J. C. Dupont 1, wildcat 1½ miles north of production at Houma field in 45-16s-17e, has 5½-inch casing set to 12,070 feet in preparation for production tests. Total depth is 12,075 feet.

Vermilion Parish: A dry hole is Humble Oil & Refining Company's Vermilion Parish School Board 1-B, mile north outpost at Pecan Island field. This test bottomed at 12,430 feet with no shows encountered. It is 7814½ feet northeast of the No. 3 well and 6772 feet northwest of the No. 2 well in Pecan Island field.

Assumption Parish: Falcon Seaboard Drilling Company et al are ready to drill the Williams Cypress 1, 11,500-foot wildcat in the Bayou Platten area. The test is 7 miles east of West Lake Verret field in the southwest quarter of the northeast quarter of 39-14s-14e.

• North Louisiana

Cotton Valley Pool Test Has First Pettit Oil Showing

Cotton Valley pool test gets first Pettit showing of oil; wildcat staked in Union Parish area of heavy leasing.

Webster Parish: Hyman Muslow et al's Warren Cox 1, 15-21n-10w, has obtained the first Pettit production in the Cotton Valley field, flowing an estimated 15 barrels of oil during a 30-minute test after being shut in for several days, and making 28-30 barrels through 11/64-inch choke during the next 2 hours. Production was from 129 perforations at 5526-55 feet after treating with acid. The well went to 6058 feet, and was abandoned after the Travis Peak proved dry. A study of electrical survey made operators decide to cement casing and complete from the Pettit.

Winn Parish: Stanolind Oil & Gas Company's Tremont Lumber Company 1, C NW SW 30-12n-1w, wildcat, is drilling below 10,741 feet in red and gray shale.

De Soto Parish: Skelly Oil Company's outpost, Thelma Nash 1, SW NE 20-12n-16w, on the north flank of the Logansport gas field, was drilling at 7390 feet. The well has had slight shows of oil.

Union Parish: Roy L. Fisher has applied for permit to drill a wildcat, W. R. Algerton 1, 14-22n-1w, 5 miles west of Conway and immediately north of Shell Oil Company's Frost Lumber Company 2, core test recently abandoned at 3250 feet. Though operators released no information, unofficial reports said the well had good saturation and leasing has been heavy in the area. Fisher's test falls on a 1-acre tract. Shell is continuing core drilling its holdings in that area and abandoned Frost 3, SW SE 31-23n-3e, at 2830 feet. Work is under way on Frost 4 and 5.

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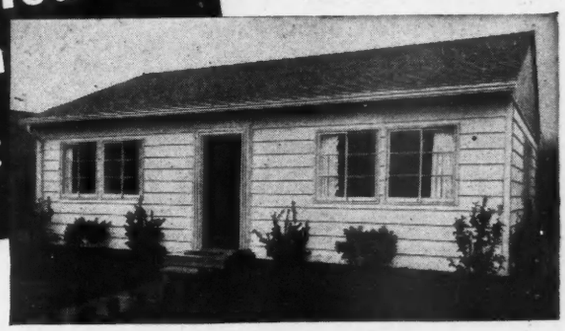

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• Arkansas

New Glen Rose Pay Indicated For Lafayette County Field

New Glen Rose pay indicated for Spirit Lake field, Lafayette County; Wesson pool gets another oil producer.

Lafayette County: Austin Stewart, H. G. Lewis, Jr., and Crow Production Company's Moore Estate A-2, C SE NW 13-16s-25w, logged showings from 3730-60 feet in the Glen Rose, indicative of a new pay for the Spirit Lake field. Cores showed saturation, good fluorescence and yellow ether cut. The well also had fair porosity in the Kilpatrick lime from 4116-36 feet and good porosity and a showing of oil from 4146-55 and 4162-74 feet. Total depth is 4245 feet.

Clark County: W. H. Littlejohn's Suitor 1, 350 feet from s/l and 2640 feet from e/l 3-8s-18w, 6 miles southeast of Arkadelphia, is a new wildcat test just spudded in.

Ouachita County: E. G. Bradham completed another good oil producing well, A. C. Wesson 1, C NE SE NE 23-15s-19w, flowing 103 barrels of oil in 24 hours through ¼-inch choke. Production is from the Glen Rose through 48 perforations at 2622-28 feet. Total depth is 3510 feet.

Kansas Allowable Up

The Kansas Corporation Commission has approved a May allowable of 280,000 barrels daily for Kansas crude production, marking the second consecutive 5000-barrel increase in the daily production figure.

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• Mississippi

LaGrange Field Extension Attempt to Make Producer

LaGrange field gets extension; Brookhaven field extension try gets encouragement; coring continued in Jones County deep test; Scott County test to be deepened.

Adams County: Big Chief Drilling Company's F. M. Baker 1, NWc 34-6n-2w, is extending the LaGrange field approximately ¾ mile southeast. After encountering the productive Wilcox zone at 6178 feet a drill-stem test at 6179-82 feet yielded a good quantity of 38-gravity oil and oil-cut mud. Production string was being set.

Lincoln County: The California Company's John Smith 1, SEc 29-8n-7e, northern extension attempt in the Brookhaven field has had encouraging results in first tests of the field's productive zone. In a drill-stem test at 10,452-67 feet in Massive sand, 270 feet of 22-gravity oil and 90 feet of oil-cut mud were recovered in a 20-minute test. Production string was set and reperforated at 10,520-22 feet where a fair sand section had previously been encountered. Tests continued.

California's Bert Smith 2, SEc 5-7n-7e, Brookhaven field, was completed as a good producer with an initial flow of 216 barrels of oil per day. In the Mallalieu field Humble Oil & Refining Company's Clifford Bowman 1, NWc 17-6n-8e, looked like a producer after core indicated oil sand topped at 10,403 feet. Core tests of the potential productive zone continued.

Jones County: Gulf Refining Company's L. L. Majors 1, SEc NE 29-6n-11w, wildcat, continued with core tests below 11,497 feet in the Comanchean zone. Cores from 11,475-77 feet recovered limy sandstone with poor porosity. No shows have been noted below 11,324 feet.

Marion County: Humble's C. Tullos 1, SWc 12-1n-18w, which previously had encountered encouragement in the Tuscaloosa sections continued with core tests below 9990 feet. No shows have been reported below 9052 feet. The well will go to 11,000.

Scott County: George Vasen was preparing to rig up Fee 1, SW NE 9-2s-11w, to deepen. The well previously was drilled to 11,209 feet in what might have been the Paluxy horizon but was finally abandoned late last year. In this section first sand was topped at 7022 feet, Massive sand at 8317 feet, and the Comanchean at 8506. No shows were reported in any of these zones. In view of the potential productive stratas which have been encountered and found wanting the indications are that the prospect will seek production from horizons rarely tested in the state.

Florida

Humble Oil & Refining Company's Gulf Coast Realty 9, C SE¼ 24-48s-29e, Sunniland field, Collier County, was installing pump after swab failed to establish production properly. Humble's Gulf Coast Realty 5, SW SW 24-38s-30e, is drilling below 11,532 feet in Sunniland. No shows have been noted.

Humble's Lee Cypress 3, SE SE 28-47s-29e, at 11,825 feet, total depth, acidized but packer failed and had to be reset.

• Ohio

Pittsfield Township Producing Area Given North Extension

Pittsfield extended north; gas found in north Hanover; south extension given Mifflin; Brush Creek has failures; granite test started in Logan County.

Lorain County: Ohio Fuel Gas Company's E. H. Heiden 1, Lot 104, Pittsfield township, drilled through the Clinton sand with a natural open flow of 1,975,000 cubic feet of gas. The pay lens at 2165-73 feet is running north and south and may carry on for some distance to the north.

Ashland County: F. E. Barnhart et al struck hard Clinton at 2882-94 feet in the Emma Bowman 1, NW NW 10, Hanover township, with an open flow of 350,000 cubic feet. The well responded to a shot and when tubed and shut in was making 900,000 cubic feet. Ohio Fuel's M. W. C. D. 2, SE NW 23, Mifflin township, a south offset to the Scott 1, was good for 1,450,000 cubic feet natural. The sand had thinned down to 11 feet at 2405-16 feet.

Muskingum County: Drilling in the west side of Brush Creek township, which had gotten off to a good start this year with no dry holes, had 2 failures and a small producer during the week. Salem Petroleum Production Company's J. H. Miller 2, SE SW 16, was dry in both the Clinton and Medina. Salem Petroleum's Fannie Seller 1, SW NE 14, was also dry in the deep sands. Fritz Oil and Gas Company's C. E. Longstreth 1, NW NW 27, had a show of gas in the Clinton sand which was shot and was dry in the Medina sand.

Logan County: The Ohio Oil Company has moved in a rotary to drill a 5000-foot test on J. C. Harrod, Lot 9965, McArthur township. The well is expected to penetrate the granite unless sufficient production is found at a lesser depth.

• Michigan

Bay County Wildcat Is Dundee Lime Discovery

McClanahan Oil Company and L. R. Reese's Knoodle 1, SW SE SE 13-17n-3e, Bay County wildcat, logged Dundee lime at 2900 feet and drilled oil-gas pay at 3015-16 feet where drilling was halted to set 5-inch casing and move in tanks. On bailer test the well showed 150 feet of fluid in 2 hours but water from shallower uncased zones prevented accurate gauge. The well, supported by Sohio Petroleum Company, is 3 miles south of a wildcat drilled by Sohio last year which was completed for a Dundee lime discovery but abandoned 3 months later as non-commercial.

Lectures Scheduled

Lectures on reservoir mechanics will be given under the auspices of the Production Technology Committee, it was announced by John McMillan, chairman of the Pacific Petroleum Chapter, AIME. Monthly meetings will be conducted by N. Van Wingnen, national chairman of the Production Technology Committee, in the Ethyl Building, Los Angeles, May 26 through January 26, 1948.

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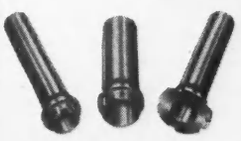

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• Illinois Basin

Illinois Operations Slowed; Wayne County Strike Likely

Rains slow operations; Wayne County discovery looms.

Illinois

With continued rains making roads practically impassable and causing highway commissioners to ban moving of heavy equipment, oil operations in the Illinois basin grew slower.

Only potential discovery recorded is The Carter Oil Company's Churchwell 1, SE SE SW 16-3s-8e, a mile northeast of the Mill Shoals pool, Wayne County. During a 2-hour drill-stem test of Rosiclare at 3440-50 feet, the well made gas in 13 minutes and yielded 750 feet of oil. Operator will test Rosiclare and also McClosky, which yielded oil shows at 3486-94 feet.

Marion County: The Omega dome area near Farina is due for another test by Paul Doran and associates where a 50-barrel producer was discovered last year. Doran and others plan to move equipment to the site as soon as roads are passable. The new location will be Millican 1, NE SW SW 16-3n-4e. The Omega dome has been of interest to operators since the Salem-Lake Centralia field was discovered, but early tests lacked porosity although recovering shows of oil. Doran's 1946 test initialed 50 barrels daily and is now making 14 barrels of oil a day.

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• California

Kern County's Bacon Hills Discovery to Go on Pump

Bacon Hills discovery lacks kick and will be placed on the pump; location made for second well following outpost discovery at East Coalinga; big gas well completed in Kirby Hills gas field; discovery on Oxnard Plain likely the most important in several years; Santa Barbara County wildcat nearing objective.

Kern County: Seaboard Oil Company's Bacon Hills discovery well, Seaboard-Bandini 3-21 in 21-28s-20e, probably will be placed on the pump. The well flowed 500 barrels of 38-gravity oil about 3 weeks ago, but in a few days began making all water from a sand above the Oceanic producing zone. Water was cemented off and the well subsequently has flowed by heads at a 110-barrel rate. Outcome of a second well, Seaboard-Bandini 24-21, to be spudded soon, will be a good indicator of the importance of the discovery.

Tests continued in General Petroleum Corporation's Tupman 18-36, northeasterly extension well in the Paloma field. Formation test of open hole from the shoe at 11,920 feet to bottom at 12,025 feet produced a fair blow, with the oil flowing by heads. A well here will be the incentive for considerable new development.

Fresno County: Sharples Corporation's Hyde 1 in 6-19s-16e, completed recently as a northerly extension of the East Coalinga field, was flowing 200 barrels of 24-gravity oil. Kirk Oil Company and Ed Pauley each have a quarter interest in the play. Location has been made for Hyde 2 about 800 feet northwest.

About 1½ miles east of the town of Coalinga, Robert S. Lytle, Operator, has staked Well 58-34, a wildcat, in 34-20s-15e. Honolulu Oil Corporation and Seaboard Oil Corporation are in on the play, which is reported to be based on the possibility of a "pinchout." Lytle now has under lease all of Sect. 34.

Solano County: Shell Oil Company has completed the biggest well to date in the Kirby Hills gas field. Wagenet 2 blew an estimated 16 million cubic feet through ½-inch choke on a formation test of the interval 5424-552 feet. Wagenet 1, completed several months ago, was good for only 5 million cubic feet. The field was discovered by Shell in January, 1945.

Santa Barbara County: Union Oil Company has staked a second wildcat on a 7000-acre lease on the Nipomo Ranch in southern San Luis Obispo County. The first test, Wineman 1 in 19-11n-33w, was a failure at 972 feet. Wineman 2 has been located about 2300 feet northeast of the first well.

Sunray Oil Corporation's Los Flores 1, wildcat in 4-8n-33w, about 1 mile southeast of production in the Orcutt field, is nearing its objective. The well drilled into the Miocene recently and is currently drilling below 5000 feet. Location is on the Los Flores Ranch, in which Universal Consolidated Oil Company has a 53 percent interest.

Ventura County: Standard Oil Company of California's McGrath 2 on the Oxnard Plain in 26-2n-23w, discovery well of what may prove to be the most important discovery in California in several years, currently is flowing 140 bar-

rels of 46.6-gravity oil and 1,340,000 cubic feet of gas through 10/64-inch choke. Flow pressure is 2900 pounds. Foundation has been poured for McGrath 63-5 about ½ mile southeast of the discovery well.

Los Angeles County: British-American Oil Producing Company and The Texas Company have made location for another well in the Alondra field as a followup to the recent successful completion of Bodger 3. Park Community 1 will be drilled about 1200 feet southeast of the field's Bodger 1 discovery and just north of Alondra Park. It will be directionally drilled to the west. No further drilling is planned on the Bodger lease for the present.

In the Del Valle field, R. E. Havenstrite, Operator, is drilling below 10,700 feet in Lincoln 15, 16-4n-17w, after discovering a new deep zone below the Bering zone, presently the sixth and deepest producing horizon in the field. The new oil sand was cored at about 10,140 feet. Havenstrite will explore ahead several hundred feet before completing the well.

Washington

Standard of California's Alderwood 1, wildcat near Everett, was reaming after drilling to 6294 feet.

Bomb Casings for Storage

Block-buster bomb casings are being used for propane storage in the Ten Section field in California by Shell Oil Company. The casings were welded to form 240-foot cylinders. These were laid in two horizontal banks of four cylinders each, with a shorter cylinder on top to provide space for expansion. Each bank stores 25,000 gallons of propane.

• Rocky Mountain Area

Wildcat in Carbon County, Wyoming, Fails on Tests

Carbon County, Wyoming, wildcat fails; Crooks Gap field gets north extension; Tensleep project in Park County tests Frontier; Church Buttes field tests nearing completion; Rangely field, Colorado, has fourth dry hole; Carter may abandon Uinta County, Utah, test.

Wyoming

Another interesting wildcat is a failure after tests of Tertiary gas shows proved unsuccessful. The Kerr-McGee and Phillips Petroleum Company test of the Baggs structure, along the Wyoming-Colorado line at Unit 1, C SE SE Sect. 10-12n-92w, Carbon County, will be abandoned. The well was drilled to 9512 feet in the Mancos shale. Only shows encountered were at 3000-4000 feet, and the test was plugged back to 3790 feet where casing was perforated in a series of sands. Only small volumes of gas were tested. Several fields in this area produce commercial gas and oil from lenticular Tertiary sands.

Fremont County: In the Crooks Gap field, northwest of Rawlins, Sinclair Wyoming Oil Company was testing Unit 7, SW SW NE 13-28n-93w, in the Muddy and Lakota sands. The well was perforated at 4955-67 feet in the Muddy and 5105-210 and 5230-90 feet in the Lakota sand. The well flowed 207 barrels of oil in 8 hours through tubing choke. This well is a north extension and apparently will be one of the best producers. Muddy sand has not been produced although drill-stem tests in 2 wells have shown that the formation should be commercially productive.

Park County: General Petroleum Corporation's projected Tensleep test in the Badger Basin field, northwestern Wyoming, was testing in the Frontier. The well is Badura 2, C NE NW 7-57n-101w, and topped the Frontier at 8050 feet. Only small shows of gas have been reported. The well is on the northwest side of the field at a location picked by seismic information, and if results of tests in the Frontier are not satisfactory the well may not be deepened to the Tensleep. Badger Basin was discovered in 1930 and for a number of years was the deepest producing field in the Rocky Mountain Region. There are now 8 wells producing approximately 1200 barrels of oil daily in the field. Resolute Oil Company of Great Falls, Mont., owns controlling interest in the field and made a farmout deal with General Petroleum Corporation for a portion of the holdings. The field has not been tested below the Dakota at 10,121 feet.

Sweetwater and Uinta Counties: Additional information on the important Church Buttes field in southwestern Wyoming will be released by Mountain Fuel Supply Company as 2 wells now being drilled by the company are reported to be in the Dakota formation and near completion. Unit 2, NE NE NE 22-17n-112w, 5 miles northeast of the discovery, is drilling below 12,450 feet, and Unit 3, NE SW NE 12-16n-113w, a mile west of the discovery, was reported coring below 12,900 feet. The

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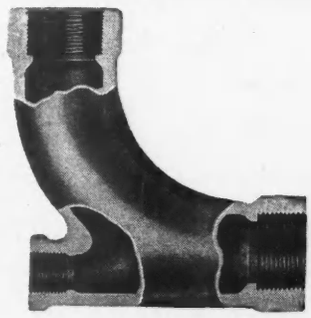

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50 KW—14 new units—Buda M-766 engine, fully enclosed. 6 (cyl.) x 5" (bore) x 6½" (stroke) x 6/1 (comp. ratio) x 86 (h.p.) coupled to splash-proof, Wooley generator 62.5 KVA, 80% P. F., 240 v., 3 ph., 60 cy. with external V-belted exciter. Governed 1200 rpm. Remote tank. 12" web H-beams form massive skid base. A rugged outdoor unit. 10,070 lbs., gr., boxed. F.O.B Chicago.

20 KW—110 new units—Le Roi D-384 engine 4 x 4½" x 6" x 6/1 x 46 coupled to Class A insulated Westinghouse ball bearing open type generator, 20 KW 80% PF 2 wire 120 V. 208 A. 60 cy. single ph., with direct connected exciter. Governed 900 rpm. Unenclosed. 15 gal., fuel tank. Steel base. 5,000 lb., net. F.O.B. Cincinnati.

20 KW—8 new units—Le Roi D-382 engine 4 x 4½" x 6" x 6/1 x 48 coupled to class A insulated Westinghouse ball bearing open type generator, 20 KW 80% PF., 60 cy., single ph., 2 wire 120/208 V 208/90 A., with direct connected exciter. Governed 900 rpm. Unenclosed. 15 gal. fuel tank. Steel base, 2,050 lb., net. F.O.B. Cincinnati.

10 KW—40 new units—Hercules JXB engine 6x3⅝"x4¼"x5.85/1x37 coupled to class A insulated Columbia ballbearing open type generator, 10 KW, 80% P. F. 3 wire. 120/240 V. 104/52 A. 60 cy., single ph., with direct connected exciter. Governed 1200 rpm. 10 gal., remote tank. Unenclosed. Steel base. 2,050 lb., net. F.O.B. Cincinnati.

The above four lots are export boxed complete with all accessories and spare parts kit. All generators are of revolving field type.

16 KW—190 slightly used units—Hercules JXD 6x4"x4¼"x5.78/1x44 h.p. coupled to G. E. generator (4 pole, 2 shunt, 2 compound, 2 commutator poles) 16 KW 100-120 V.D.C., 162-133A., 1100-1200 rpm (by adjustment of Pierce governor). 4 sets of 3 brushes each. Complete control panel. 6 V., system ignition and starter. Run in time only on engine-generator not exceeding 100 hours. Entire unit is housed with hinged side panels and mounted on 4-wheel trailer with springs and shocks. 6.00x16 tires, slightly used, with spare wheel, 73" wheelbase, 56" road gauge, 85⅝" road clearance axles, 8" clearance tie rods. Excellent condition. Built by or for G. E. Co., 3,250 lb., net 7 to carload. Priced low. F.O.B. Ogden, Utah.

NEW GASOLINE ENGINES

60 new engines—Hercules JXD 6x4"x4¼" x320 cu. in. less radiator or batteries, with carburetor, 12 V., starter and generator, air cleaner, oil filter, fuel pump, manifold, double fan assembly, No. 4 flywheel and automotive type clutch. Boxed for export. F.O.B. Pennsylvania.

USED ELECTRIC WELDERS

96 used units—Harnischfeger single operator, Model WK-300 Motor 220/440 3 ph., 60 cy., 15 HP 1750 rpm. Generator 40 V. D. C., 300 A. F.O.B. Panama City, Florida.

213 used units—Lincoln single operator, Model SAE-400 Motor 440 V., 3 ph., 60 cy., 20 HP, 1750 rpm. Generator 40 V. D. C., 400 A. F.O.B. Panama City, Florida.

The above two lots of welders were built in 1943, used in the shipyards 15 months, and were then withdrawn from use. All are in running order complete with all controls, starting box, lead in and ground cables. Priced low.

For further information write or wire

4554 North Broadway, Room 374, Dept. 7
Chicago 40, Illinois

FOR SALE

■ FOR SALE—10,000 ft. 7" casing, 17 and 20 lb.; 10,000 ft. 2" tubing; 3,000 ft. 2½" line; 1,000 ft. 5" casing. Earl Leech, Ph. 226, Rockdale, Texas.

OIL TOOL FACTORY FOR SALE

To Settle Estate

Getty Factory in Jennings, Louisiana, on Highway 90 and Southern Pacific Railroad.

Main buildings new in 1938. Shop 18,000 sq. ft. Two-story air-conditioned office building large record vault, modern furniture and office equipment.

Shop equipped for screen and packer work. This type of business has been continuous since 1907. Also equipped for general machine shop, precision work.

Under court order, minimum price for which plant can be sold is $125,015.62. Terms: Cash when deed is tendered.

Sale may be negotiated with Executrix, Getty Estates, Getty Factory, Jennings, La.

Inquiry may be addressed to G. P. Modlish, manager of the factory, who will arrange inspection of plant and records on request.

FOR SALE

2—Climax Engines—R-225 c/w Emsco Chain Drive Transmission and one Waukesha starting engine.
2—Buda Engines—JL-1335 c/w Compounding Unit and two Novo Starting Engines.
1—LeRoi Engine—RXIV—c/w LeRoi Starting Engine.
1—Emsco—Type "H" Reverse Clutch.
1—36" Parkersburg Hydromatic Brake—cradle mounted with Emsco multiple jaw clutch coupling and Emsco Fluid Level Control.
1—Emsco—Type NB-42 five sheave Traveling Block.
1—Ideal—8" Type "M" Swivel.
1—Ideal—6" Type "E" Swivel.
1—Set BJ—Type "B"—4½" to 10¾"—Tongs complete.
1—Baash-Ross—Type 2RS6—Kelly Bushing with 4½" rollers.
All items completely reworked and in first class shape.

M. ROSENBLOOM PIPE & SUPPLY CO., 3538 Mansfield Road, Shreveport, La.

FOR SALE

2—Complete rotary rigs with 94 foot masts and drill pipe. One with Cardwell drawworks with GAk Waukesha motors, Gardner-Denver Pump; one with unit rig drawworks with D-13000 caterpillar motors, Ideal C-150 pump.
The following additional equipment:
3700 feet 3½ OD drill pipe with Reid full hole tool joints.
3—4½ OD drill collars.
2—Overshot sockets for 3½ drill pipe.
1—Regan 5-sheave 100 ton crown 30" diameter sheave, 1" groove.
1—Regan 4-sheave 80 ton crown 30" diameter sheave, 1" groove.
1—American Well prospecting Co., 5-sheave, 125 ton crown, 36" diameter sheave, 1⅛" groove.
Complete information furnished upon request. All of above in good condition. Write or call **KIOWA DRILLING COMPANY,** 717 Union National Bank Building, Wichita, Kansas. Phone 3-8013.

FOR SALE:

2—125HP Oil field boilers
250-lb. W.P.

2—100HP Oil field boilers
200-lb. W.P.

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SELMAN CITY, TEXAS
Pho. 56—Turnertown

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■ Well - established, expanding geophysical company offers openings for thoroughly experienced central office interpreters, field seismograph party chiefs, computers, observers and surveyors. Excellent salaries and opportunity for advancement. Please state in first letter type of position expected, education, age, experience, salary expected and date available. Address: Box 29 c/o The Oil Weekly, Houston, Texas.

■ FOREIGN POSITIONS: Junior Engineers, Material Men, Material Accountant, Payroll Clerks, Field Auditors, Warehouse Clerks, Geologists, Draftsmen, Male Stenographer-Clerks, Diesel Mechanics. These positions and many more are now opened for experienced applicants. Prefer single men. Fee paid by employer. Mail your resume to: CHAS. J. LOVELESS PERSONNEL SERVICE, 508 MAYO BUILDING, TULSA, OKLAHOMA.

■ WANTED: EXPERIENCED SALES REPRESENTATIVE in Gulf Coast area, with headquarters in Houston, wanted by well known oilfield equipment company. Production equipment and gas lift experience preferred. In reply give complete information as to salary expected, experience, age, education, and etc. Address reply to: Box 38, c/o The Oil Weekly, Houston, Texas.

■ SAFETY ENGINEER by substantial drilling contractor operating Louisiana-Mississippi Gulf Coast. Must have thorough training, experience, knowledge drilling equipment, capable handling vigorous accident prevention program. Write qualifications, experience, salary required, references, P. O. Box 670, Fort Worth, Texas.

■ WANTED—Field geologist and instrument man for surface mapping in west central Texas. Give full particulars and salary expected in first reply. P. O. Box 670, Fort Worth, Texas.

FIELD GEOLOGIST

Foreign, aerial mapping, mainly reconnaissance but also indicated detail surveys. Approximately 5 years experience. Minimum salary $6000 plus allowances. Write to **The Atlantic Refining Co., Rm. 900, Box 7258, Philadelphia 1, Pa.**

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■ ASSISTANT TO LAND DEPARTMENT official large expanding independent oil company. Must have executive ability, thorough experience, training, handling titles, contracts, operating agreements, incidental records common to extensive leasing and development operations Mid-Continent, Gulf Coast states. Send qualifications, references, salary expected. Address Box 40, care of Oil Weekly, Houston, Texas.

■ Well established independent oil company desires experienced land man, located Baton Rouge, Louisiana. Thoroughly trained leasing and title work Gulf Coast States. Advise qualifications, age, salary required, references. Address Box 39 The Oil Weekly, Houston, Texas.

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WANTED — Experienced geophysicists, computers, and recorders by an expanding contract seismograph company in marine exploration. All inquiries held confidential.

Experienced draftsman for detail map work.

Inexperienced personnel with formal background in engineering, physics, mathematics, radio, radar, geology and allied sciences solicited.

State age, education, experience and status of availability in first letter.

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Heavy Duty—Single Drum—Double Gypsy

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110 Volts—D. C.

Model No. 271 (2 cylinders, 20 kw) . . . . $ 950.00
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Long Beach 13, California

latter test is now the deepest ever drilled in the Rocky Mountain Region.

The Church Buttes structure is a seismic high and was discovered by Mountain Fuel Supply Company, with Union Pacific Railroad as partner, a year ago. The discovery has still not been completely tested but estimates of potentials are as high as 100 million cubic feet of gas daily with 500 barrels of 40-gravity distillate.

Colorado

The Idaho, Sharples and Wasatch companies during the past week abandoned the fourth dry hole for the Rangely field. The well is Larson 1-26, C SE SW 26-2n-103w, on the west side of the field, and had been expected to be dry as it was on approximately the same structural contour as the recently abandoned Continental Rooth 3. The well topped the Weber at 6753 feet and found only hard, dry sand in the top of the formation.

Utah

The Carter Oil Company may abandon its Vernal wildcat, which caught fire recently. This was Carter's first operation in northeastern Utah, but it is reported that 2 more tests in the area are planned by the company. The well was Davis 1, C NE NW 33-4s-20e, Uinta County, and was drilled to 8001 feet. It was plugged back and casing run to test sands around 6000 feet which had shown some gas when the section was drilled. Tests proved the gas flow to be non-commercial and operator was planning to abandon when the rig caught fire. One man died and 5 others injured before the flame could be extinguished.

• Canada

Two Wildcats Staked South Of Imperial's Leduc Well

McCall-Frontenac Oil Company, Canadian affiliate of The Texas Company, has staked location for 2 wildcats on seismographed structures south of Imperial Oil, Ltd.'s, Leduc oil discovery. Both will commence drilling in mid-May and will penetrate the Devonian with probable completion depth about 6500 feet.

The wells are in Lsd 14 14-48-27w¼, about 16 miles south and five miles west of the Leduc discovery and Lsd 1 20-46-26, about 25 miles due south.

Imperial's Leduc 2 extension test was coring at 5159 feet in the Devonian discovery zone down the southwest flank from the discovery. Some oil and gas showings were found with no sign of water but with porosity not well developed. The well was deepening. Imperial Leduc 3, northeast and updip from the discovery, was coring at 4903 feet.

SITUATIONS WANTED

■ Land-title man, 38, 15 years' experience Texas, New Mexico, North Louisiana. Thorough knowledge taking blocks, curing titles, all phases trading farmout and other drilling deals. Considerable experience supervision drilling wells and production. Best of references. Free to go anywhere in U. S. Good and valuable contacts. Desire connection with aggressive well financed independent or small company. Salary-interest basis preferred. Address: Box 37, c/o The Oil Weekly, Houston, Texas.

■ LANDMAN, 15 years extensive experience in trading, titles, and records in Mid-Continent area desires connection with major company or independent. Address: Box 33, c/o The Oil Weekly, Houston, Texas.

EXPLORATORY FAILURES

CALIFORNIA WILDCATS

Humboldt County: Texas Co.'s Anderson 1, 8-2n-1e, Hydesville area, abnd 4-18-47 at 9082.

Kern County: Hancock Oil Co.'s Di Giorgio 1, 4-31s-29e, Arvin area, Edison Shale 3917, Santa Margarita 6483, Schist 6192, abnd 4-18-47 at 6475.

Honolulu Oil Corp.'s Honolulu-General Pet.-Derby 1, 15-31s-29e, Arvin area, Schist 7807, abnd 4-20-47 at 7810.

Superior's Quinn 51, 30-25s-27e, Jasmine area, abnd 4-24-47 at 3926.

Santa Barbara County: Rothschild Oil Co.'s Orella 2, 31-5n-20w, Capitan area, abnd 4-17-47 at 3882.

ILLINOIS WILDCATS

Coles County: John E. Carlson's Johns 1, se nw sw 32-12n-10e, abnd 1200.

Effingham County: J. J. Lynn's Miller 1, nw ne sw 35-6n-6e, abnd 2858.

Jefferson County: K. M. Bayer et al's Page 1, se se ne 34-4s-4e, abnd 3407.

INDIANA WILDCAT

Posey County: J. E. Bauer's Newton 1, sw ne ne 5-1n-11w, abnd 2170.

KENTUCKY WILDCATS

Henderson County: Carter's Sigler 1, 12-O-22, abnd 2722.

Sun's Willett 1, 25-Q-22, abnd 2630.

NORTH LOUISIANA WILDCATS

Franklin Parish: Big Chief-Glasscock Drlg. Co.'s D. Slack 1, 660 fr sl 330 fr wl nw sw 1-15n-7e, Chalk 2990, Gas Rock 3000, Tuscaloosa 3050, Paluxy 3807, abnd 4-25-47 at 3923.

Madison Parish: Victor Grage's Madison Parish School Bd. 1, 704 fr wl 618 fr sl irr sect 35-18n-13e, Wilcox 2208, Gas Rock 3880, Marine Tuscaloosa 3894, Massive sd 4077, Paluxy 4128, abnd 4-22-47 at 4513.

SOUTH LOUISIANA WILDCATS

Acadia Parish: Sun's Haas Estate 1, 1980 s 560 w of nec 23-7s-1w, 1½ mi se Ritchie prod, abnd 4-19-47 at 9858.

Iberville Parish: Humble's Iberville Parish School Bd. 1, fr nwc sect 16 go 1980 sly alg wl th 1980 ely parallel to nl to lcn in 16-11s-12e, 3 mi sw Whitecastle fld, abnd 4-26-47 at 12,332.

MICHIGAN WILDCATS

Allegan County: J. W. Lang Co.'s Drozd 1, sw sw ne 31-2n-15w, Traverse lime 1214, abnd 4-24-47 at 1221.

W. Spencer Cook's Calkins 1, nw ne sw 20-3n-12w, Traverse 1661, abnd 4-23-47 at 1662.

Isabella County: Scott and Bell's Eddy 1, nw nw se 3-15n-6w, abnd 4-19-47 at 1750.

Kalamazoo County: Harris and Fortney's Magierka 1, se ne sw 31-1s-12w, Traverse 1280, so 1282, abnd 4-25-47 at 1284.

Kent County: J. J. McGerry's Vander Hdye 1, se sw sw 14-9n-11w, Traverse 2290, abnd 4-25-47 at 2333.

Bryon MacCallum's Landheer 1, se ne ne 27-10n-12w, Traverse 2355, abnd 4-21-47 at 2365.

Lake County: Glavin Oil Co.'s Bates 1, nw se se 2-18n-11w, Dundee 3676, abnd 4-18-47 at 3805.

Missaukee County: T. R. Russell's State 1, sw nw sw 1-21n-6w, Dundee 3831, abnd 4-20-47 at 3856.

Van Buren County: Oil Producers' Blanchard 1, sw se sw 1-1s-13w, abnd 4-22-47 at 1348.

MISSISSIPPI WILDCAT

Neshoba County: Slick Oil Co.-Plains Prod. Co.'s J. D. Breazeale 1, nw sw se 28-12n-10e, Selma 1797, Eutaw 2664, Tuscaloosa 3242, Massive sd 3880, Lime 5812, comp 4-20-46 at 6132.

NEW MEXICO WILDCAT

Lea County: John W. Sorrells et al's Sorrells-Federal 1, c sw ne 27-22s-34e, elev 3413, salt 2095, lime 3665, Yates 3837, abnd 4-16-47 at 4202.

OHIO WILDCAT

Ashland County: Ohio Fuel Gas Co.'s Brady Stave Co. 1, se ne 23, Orange, Clinton, abnd 4-20-47 at 2800.

OKLAHOMA WILDCATS

Cotton County: Snoddy Brothers' Holmes 1, ne ne sw 13-2s-13w, abnd 2001.

G. B. & V. C. Howell's Tolett 1, nw nw ne 7-3s-11w, abnd 2007.

Elmer Graham's Ota-too-ch-nip-pah 1, nw nw nw 14-4s-11w, abnd 2049.

Creek County: Tom Palmer's Thornton 1, sw se nw 9-17n-9e, abnd 3278.

Garvin County: Texas Co.'s Carlock-Ledbetter 1, sw sw se 1-4n-3w, abnd 8094.

Hughes County: Republic Nat. Gas Co.'s Harrod 1, sw sw ne 7-8n-10e, abnd 3523.

Lincoln County: Wilcox Oil Co. et al's Potter 1, ne sw se 24-16n-2e, abnd 5581.

Oklahoma County: Ace Gutowsky's Hunt 1, ne ne nw 29-13n-1w, abnd 6446.

Payne County: Skelly's Smith 1, ne se sw 14-19n-3e, abnd 4400.

Tillman County: H. J. Heartwell's Fisher 1, nw nw nw sw 9-1s-14w, abnd 1020.

WEST TEXAS WILDCATS

Dickens County: Humble's Matador Land & Cattle Co. 1-G, 660 out sec C. U. Connellee Sur 8, elev 2732, shale 4790, abnd in granite 4-16-47 at 8248.

El Paso County: J. S. Meriwether et al's Brown Realty Co. 1, 1480 nsl 4800 ewl sect 35, Maria Rodriquez sur, jkd and abnd 4-15-47 at 408.

Midland County: Humble's Dixon 1, c sw se T&P Ry. 9, blk 37, T-3-S, elev 2601, abnd 4-20-47 at 6150.

Mitchell County: Standard of Texas' Womack 1, c se se T&P Ry. 5, blk 28, T-1-N, elev 2179, salt 1120, San Andres lime 1675, abnd 4-25-47 at 3085.

Winkler County: Mid-Continent's TXL 1-N, c se ne T&P Ry. 21, blk 46, T-1-N, elev 3355, Yates 2850, San Andres 4330, Glorietta 5350, Clear Fork 5750, Tubb 6150, Wolfcamp 7615, base Permian 7975, Woodford 8030, Devonian 8065, Silurian 8580, abnd 4-20-47 at 9605.

Yoakum County: Texas Co.'s Samuels 1, c ne nw sect 242, blk D, J. H. Gibson sur, elev 3804, San Andres 4510, abnd 4-23-47 at 5355.

EAST CENTRAL TEXAS WILDCATS

Collin County: Humble's Wester 1, 1450 snl 2100 ewl Andrew J. Culwell sur, elev 710, Comanche 1117, Goodland 1695, Paluxy 1757, Glen Rose 2372, Pennsylvanian 3079, Ellenburger 6830, abnd 4-21-47 at 7850.

Humble's Wester 1, 1450 snl 2100 ewl of Andrews J. Culwell sur, elev 710, Comanche 1117, Paluxy 1757, Glen Rose 2372, Pennsylvanian 3079, Ellenburger 6830, abnd 4-24-47 at 7850.

Denton County: Gibson Oil Corp.'s Forrester 1, 220 out nwc J. B. Baroux sur, elev 726, Bend 1785, Marble Falls 1918, abnd 4-16-47 at 1920.

Robertson County: Carter-Jones Drlg. Co.'s Lastor 1, 3550 fr nwl 5450 fr nel Wm. Thomas sur, abnd 4-19-47 at 1412.

NORTH CENTRAL TEXAS WILDCATS

Brown County: F. R. Jackson et al's Ball 1, ne ne sect 69, Brown CSL sur, jkd and abnd 4-11-47 at 1917.

Stonewall County: Pan-American Prod. Co.'s Jean 1, sw se ne H&TC Ry. 166, blk 1, elev 1761, Ellenburger 6218, abnd 4-18-47 at 6341.

Taylor County: Walter Pidgeon et al's Tillett 1, 1850 nsl 3050 ewl sbdn 6, s½ Lge 145, Guadalupe CSL, elev 2103, abnd 4-14-47 at 3347.

Texas Co.'s Malone 1, 330 out swc 438-ac lse, J. Wm. Page sur 123, elev 1818, abnd 4-22-47 at 3010.

Throckmorton County: W. C. Estes et al's Gaither 1, 1050 snl 2750 wel of w 235 ac of Day Land & Cattle Co. sur, lime 1588, abnd 4-23-47 at 1758.

W. Glenn Weatherford's Horton 1, 160 nsl 1610 ewl sect 935, TE&L Co. sur, abnd 4-23-47 at 750.

WEST CENTRAL TEXAS WILDCAT

Concho County: Hedrick Oil Co.'s Garner 1, ne ne se H&TC Ry. 9, blk 70, elev 1677, Palo Pinto 1427, Home Creek 1190, Strawn 1665, Ellenburger 2193, abnd 4-11-46 at 2237.

NORTH TEXAS WILDCATS

Archer County: R. C. Dublin's Campbell 1, 1700 nsl 1400 ewl J. Ruddle sur, abnd 4-5-47 at 1079.

R. A. King et al's Perkins 1-A, se se sw S.P. Ry. 2, elev 1055, KMA lime 4099, Ellenburger 5010, abnd 4-16-47 at 5065.

Baylor County: B.O.M. Oil Co.'s Mills 1, 1700 out sec sect 3136, TE&L Co. sur, abnd 3-31-47 at 1545.

Fortex Oil Corp. et al's Mills 1, 2150 nsl 1083 ewl sect 2429, TE&L Co. sur, abnd 4-15-47 at 1577.

Cooke County: Shell-Seitz-Comegys & Seitz' Pearce 1, 330 snl 990 wel S. C. Adkinson sur, Winger sand 3956, Ellenburger 4124, abnd 4-22-47 at 4209.

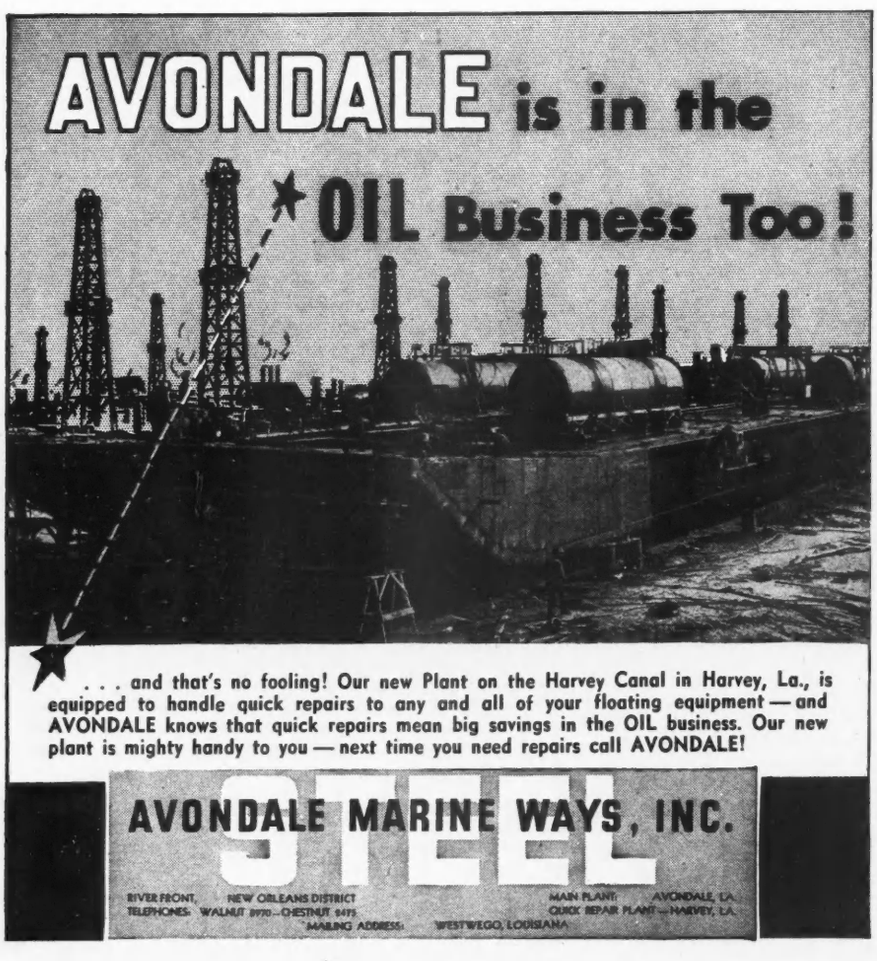
Cottle County: Anderson-Prichard Oil Corp.'s Wooley 1, 467 n 470 w of B&B sur 64, but in B. L. Wooley sur 6, elev 2024, lime 4362, chert 5310, sand 5380, abnd 4-20-47 at 5413.

Jack County: Warren Oil Corp.'s McClure 1-B, 1598 snl 2174 wel of A. Bogart sur 8, Ellenburger 6172, abnd 4-18-47 at 6301.

Knox County: Doyle Pet. Corp.'s Bates 1, 990 nsl 330 ewl D&W Ry. 1, blk 2, elev 1352, abnd 4-23-47 at 1634.

NORTHEAST TEXAS WILDCAT

Houston County: M. H. McMurrey and Texas Co.'s Smith 1, 563 fr nel 348 fr nwl 50-ac tr,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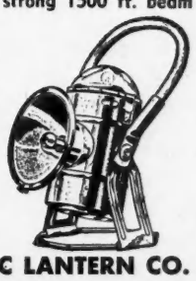

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J. G. Thompson sur, elev 232, Pecan chalk 4334, Austin 5368-5652, Woodbine series 5769, sand 5862, abnd 4-11-47 at 5976.

SOUTH CENTRAL TEXAS WILDCATS

Gillespie County: L. Underwood Roundtree's Richard Knott 1, (OWDD) 330 fr sl 1170 fr wl 351-ac lse, sur 154, otd 700, abnd 4-8-47 at 3190.

LaSalle County: Arkansas Fuel Oil Co.'s H. W. Tatum 1, 2061 fr swl 660 fr sel I&GN sur 35, blk 5, Edwards li 7851, abnd 4-14-47 at 8102.

Milam County: Wilson Harding, Tr.'s T. S. Henderson et al 1, 660 fr wl 1280 fr nl 350-ac lse, Jose Leal sur, Georgetown 3680, Edwards 3895, abnd 4-14-47 at 3908.

SOUTHWEST TEXAS-LOWER COAST WILDCATS

Duval County: Bridwell Oil Co.'s A. G. Villareal 2, 1400 fr el 3266 fr nl 1200-ac lse, San Andres Gr, 2 mi e of Benavides fld, abnd 4-16-47 at 5036.

San Patricio County: Republic Nat. Gas Co.'s John Hancock Mutual Life Ins. Co. 4, 467 fr s&wl 1557-ac lse, 2¼ mi w Taft fld, Theo. Carrol sur, abnd 4-17-47 at 8837.

Starr County: Texon Roy. Co.'s Annie M. Kelsey Bass 1, 5280 s alg el fr m/nly/cor Eliza Davis sur 355, th 330 w at ra, 4½ mi se Sacatosa gas prod, abnd 4-14-47 at 2600.

Webb County: O. W. Killam's Garcia-Villareal 1, 330 fr ne&nwl sur 1101, 640-ac lse, 2 mi nw Oilton fld, 2 mi w Killam fld, abnd 4-10-47 at 3530.

Willacy County: Humble's W. S. Murphy 2, 330 fr el 660 fr n&wl lot 10, blk 75, Gulf Coast Irr. Co. sbdn, 130.8-ac lse, San Juan de Carricitos Gr, abnd 4-19-47 at 10,380.

SOUTHWEST TEXAS-LOWER COAST OUTPOST

Duval County—Piedras Pintas: H. H. Howell's Gulf Oil Corp. 1-A, 330 fr sl 2780 fr wl S. R. Peters sur 186, ⅔ mi e of prod on e flk of dome, 640-ac lse, abnd 4-11-47 at 5163.

MIDDLE TEXAS COAST WILDCATS

Goliad County: Dan Auld et al's Mary Kolodzey 1, 660 fr swl 548 fr sel Hanry Pease sur, 3 mi ne Slick-Wilcox fld, Luling 7620, abnd 4-15-47 at 7759.

Magnolia's Wilkinson Est. 2, 1980 fr sel&el 1750.7-ac lse, W. P. Miller sur, abnd 4-18-47 at 11,494.

Karnes County: J. H. Dunn et al's Otto Radke 1, 330 fr nw&swl 88-ac lse, Louis Manchaca Gr, 2500 e of Falls City prod, abnd 4-16-47 at 6110.

Geo. Parker's Otto Platte 1, 330 fr nw&swl 279-ac lse, D. W. Isbell sur 47, 2½ mi s Gillette, abnd 4-6-47 at 6323.

UPPER TEXAS COAST WILDCATS

Brazoria County: Lee Bros.-Shuart et al's David C. Wilke et al 1, 667 fr sl 653 fr el lot 4, blk 5, HT&B sur, 106-ac tr, abnd 4-13-47 at 5520.

Montgomery County: J. D. Kinsala-W. F. Newton's J. B. Spiller 1, fr sec W. H. Hulon sur go 2100 w alg sl th 330 n at ra to lcn, 100.5-ac lse, Hockley 3186, Cockfield 4019, abnd 4-10-47 at 4512.

Wharton County: Jos. Hornberger-John Ferguson's J. F. Kubela 1, w½ nw¼ sect 19 ETRR sur, 2 mi w Withers fld, abnd 4-20-47 at 7156.

WYOMING OUTPOST

Weston County—Mush Creek: Mush Creek Oil's Shell 1, c ne sw 10-44n-63w, Newcastle 3975, abnd 4-20-47 at 4060.

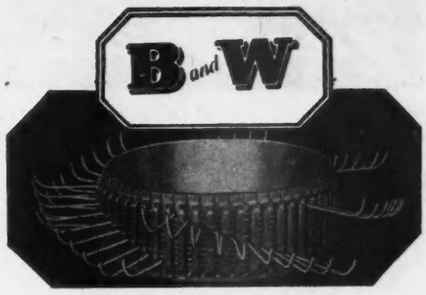
Tulsa, Los Angeles Are Named Sites for AIME Fall Meetings

Tulsa and Los Angeles have been selected for the 1947 fall meetings of the Petroleum Division, AIME.

The Tulsa meeting will be held at the Mayo hotel October 8-10, and the Los Angeles session will be at the Elks Club October 23-24. Lloyd Elkins, Stanolind Oil & Gas Company, Tulsa, has been appointed general chairman for the southwestern meeting, with Sam Grinsfelder, vice president, Union Oil Company of California, serving as general chairman at the Los Angeles meeting.

Technical and economical material for both programs is being assembled by a commitee headed by Nico Van Wingen, Richfield Oil Company of Los Angeles, and H. J. Struth, editor of the Petroleum Data Book, Dallas.

The AIME Petroleum Division will stage a two-day technical program in conjunction with the Institute's regional meeting in Denver, September 28-October 2. Material is being assembled by T. C. Hiestand, Cities Service Oil Company, Casper, Wyo., and J. J. Zorichak, Rangely Engineering Committee, Rangely, Colo.



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SQUEAKS from the BULL WHEEL

Harmless Hoist

A woman complained to her neighbor, who every evening walked his dog by her house, because the Scottie always paused by her new shrubs.

"Now don't fret, Ma'am. I always start around the block the long way, and by the time he reaches your bushes, it's only a gesture.

Law of Averages

"Dear Dorothy Dix: Last night I went out with a new boy friend. I never drink anything, but he insisted on me having a cocktail. And before dinner was served we had another one. Did I do wrong?"

(Signed) "Confused."

"Dear Confused: My answer is this—Probably."

The Woman's Way

"Doctor, will my little Jimmy be able to play the piano when his broken arm heals?"

"Certainly, Madam."

"Doctor, I think you're marvelous! I mean really. He never could play the piano before!"

Is There a Hell?

A negro preacher had chosen for his subject, "Is there a hell?"

"Brethren," he said, "de Lawd made the world round like a ball." "Amen!" sighed the congregation. "And de Lawd made two axles for the world to go 'round on, and He put one axle at the South pole."

"Amen."

"And de Lawd put a lot of oil and grease in de center of de world so as to keep dem axles greased and oiled. An' then a lot of sinnahs digs wells in Texas an' steal de Lawd's grease and oil. An' they dig wells in Oklahoma and Californy an' Russia an' Pennsylvania an' steal de Lawd's oil and grease.

"An' some day, brethren an' sistern, dey will have all of de Lawd's oil an' dem axles is gonna get hot, an' then dat will be Hell, brethren, dat will be Hell."

Hints for Householders

Say it with flowers, say it with sweets.
Say it with kisses, say it with eats;
Say it with jewelry, say it with drink.
But never, oh, never, say it with ink!

Not Yet, Anyway

Sunday School speaker: "I have lived in this town all my life. By actual count there are 55 tap rooms and saloons in the town, and I am proud to say I have never been in one of them."

Usual voice from the rear: "Which one?"

Private War

A new serum had been developed to bring statues to life. The inventor sprinkled some of the concoction on a statue of Stonewall Jackson. The statue immediately came to life and descended from his pedestal in a park. The inventor immediately asked the General the first thing he intended doing.

"The fust thing, suh," exploded Stonewall as he released his pistol from its holster, "the very fust thing ah intends is to declare war on those *!?:/ pigeons."

Ex-Orderly, Ex-Valet

A retired Army officer happened to run into his former orderly, also retired, and persuaded him to become his valet. "Your duties will be exactly what they were in the Army. You can start by waking me tomorrow morning at 7."

Punctually at 7, the ex-orderly strode into his boss' bedroom, shook him into wakefulness, then leaned over and spanked the ex-officer's wife on the lower extremities. "All right, baby, it's back to the village for you."

Life Is Like This

"Waitress, give me a slice of ham, piping hot, fragrant with the rich aroma of cloves, brown sugar and steaming sauce. Serve it between slices of brown and crackly crusted bread. Draw me a cup of rich, flavorful coffee and add to it some thick, rich cream."

"Gotcha. Pig on rye and java with."

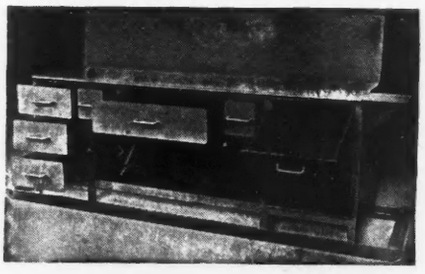
Slight Error

An applicant for a job gave as one of his references a prominent Bostonian. The business man sent a query to Boston concerning the applicant and received a long letter tracing the young man's ancestry back to John Alden.

"Thank you for your interest," the business man wrote back, "but we wanted the young man for business, not breeding purposes."

OWEN

TYPE "A" WORK BENCHES



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HOUSTON, TEXAS

C. C. Irby of Mt. Pleasant, Mich., division production superintendent for Sohio Petroleum Company since, March, 1943, has been transferred to Russell, Kansas, as head of Sohio's Kansas producing division. He will be succeeded in Michigan by **John Buckley,** Michigan district engineer the past two years. Irby, member of the Michigan Oil Advisory Board, was with the Turner and Gordon companies in Michigan from 1935 to 1943, and was with The Carter Oil Company and Humble Oil & Refining Company in Oklahoma and Texas before going to Michigan.

C. C. Irby

»

Charles H. Hudson, Oklahoma Division petroleum engineer for Magnolia Petroleum Company, has been transferred from Oklahoma City to Dallas headquarters as assistant chief petroleum engineer, effective May 1. He succeeded **Dan C. Williams, Jr.,** who resigned. **Henry L. Waszkowski, Jr.,** Healdton district petroleum engineer, was promoted to fill the vacancy at Oklahoma City, while **Ira B. Stitt, Jr.,** is his successor.

»

Robert Hancock, geologist for Magnolia Petroleum Company in the Oklahoma division and previously with the I.T.I.O. Company, has resigned to engage in consulting practice with offices in the Braniff building, Oklahoma City.

»

John P. Thomson, formerly district landsman in Amerada Petroleum Corporation's Jackson, Miss., office, has been transferred to the Tulsa office as second in charge of the firm's geological office. **B. F. Murphy** is district geologist there. He was formerly in the Tyler, Texas, office.

»

Ward Kemper, assistant chief accountant of Mene Grande Oil Company, San Tome, Venezuela, has returned to Venezuela after a two months visit in the U. S.

»

Paul L. Guarin has been named chief mechanical engineer on Shell Oil Company's regional staff with headquarters at Houston. He succeeds **Lawrence O'Donnell,** who is resigning to devote full time to private interests. Guarin has been with the company for 21 years. Before entering military service in 1942, he held many responsible positions for the company in the Mid-Continent and Texas-Gulf areas. Until his recent appointment he was special assistant to the vice president.

Paul L. Guarin

Andre J. DeMargue, manager of Societe Nationale des Petroles du Languedoc Mediterraneen, a company operating in southern France, is in Tulsa after visiting in the Gulf Coast area. Before returning to France at the end of May, he will inspect the oil fields of Colorado and California.

»

Roy L. Pepper, Fort Worth division chief clerk for Sinclair Prairie Oil Company, has resigned to join **E. L. Heard,** Odessa, Texas, general oil field contractor, and is succeeded by **Mack Treece,** former district clerk at Odessa.

H. C. Vanderpool, geologist for Seaboard Oil Company, Dallas, has resigned to become chief geologist for The Texas Pacific Coal & Oil Company, Fort Worth, assuming duties heretofore performed by **Charles E. Yager,** who will devote full time to his position of executive vice president.

»

I. H. Hughes, formerly with Phillips Petroleum Company for 13 years, is now chief petroleum engineer for the International Petroleum Company of Peru, located at Talara. He served a year with PAW in Washington, D. C.

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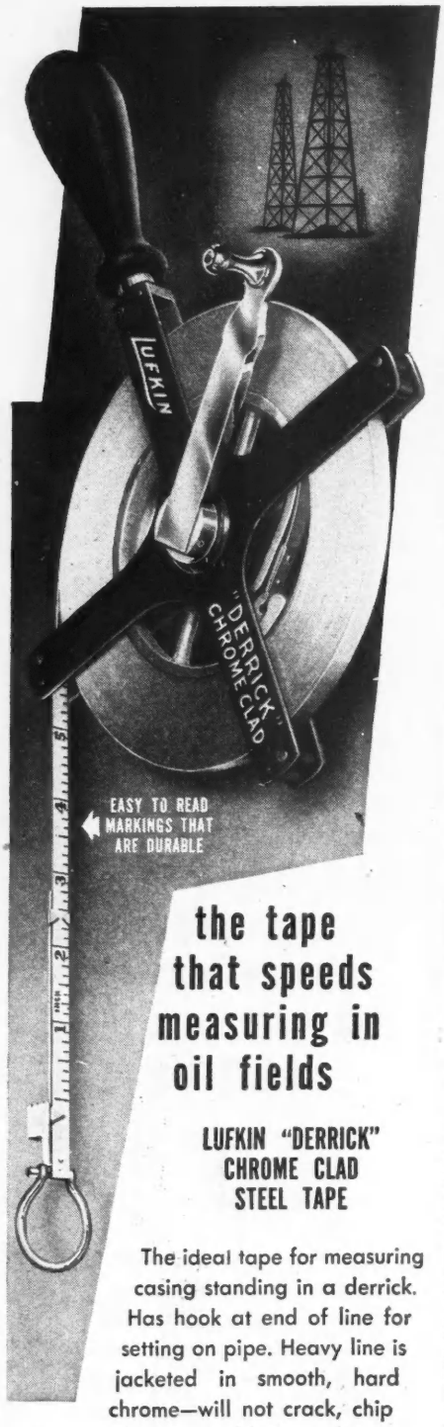

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FOR ACCURACY

MEN IN THE INDUSTRY NEWS

C. A. Barabe, assistant Eastern Division sales manager of Caterpillar Tractor Company, will start a six-month medical leave of absence June 15, and **W. N. Foster,** divisional district representative, has been promoted to the assistant managership. Barabe, a member of the Caterpillar organization since 1937, served in the Army during World War 2 in the North African Sicilian and Italian campaigns and was severely wounded at Anzio, Italy. Foster joined Caterpillar in 1934 and became a district representative in 1944, serving Indiana, Kentucky, and a part of Ohio.

W. N. Foster

»

Commer Carey, T. B. Jackson and **Crawford B. Jackson,** all of Houston, have incorporated the Carey Drilling Corporation to operate in Texas.

»

E. J. Schiffer, veteran of 32 years in Gulf Oil Corporation's traffic department, has been named general traffic manager, succeeding the late **J. C. Beck.**

»

Edgar A. Rogers, Chattanooga Bank Building, Chattanooga, Tenn., has announced the association with him of **Chester A. Roush, Jr.** Rogers' business is the analysis of process plant requirements and the application of equipment. Roush is a chemical engineering graduate of Georgia Tech who has recently returned from duty with the U. S. Navy as a lieutenant in submarines.

»

Dwight Davis has been transferred from the Shreveport, La., to the Jackson, Miss., office of Barnsdall Oil Company as district landsman.

»

Hubert Guyod, Houston well logging consultant spoke before the Petroleum Engineering Club (AIME student affiliate) of Texas A. & M. College April 25.

»

Robert P. Tyler, formerly general sales manager, has been named vice president in charge of sales for Macwhyte Company, Kenosha, Wis.

»

A. B. Reese, Jr. has been appointed regional sales manager at Ft. Worth, Texas, of the Superior Engine Division of The National Supply Company, according to **Robert M. Pearson,** sales manager of the division. Reese, an engineering graduate of Ohio State University, has been assistant chief engineer of the division's Springfield, Ohio plant.

A. B. Reese, Jr.

Rudolph E. Reimer, secretary and treasurer of Dresser Industries, Inc., Cleveland, was elected a vice president of the company. Reimer has been associated with Dresser interests since 1929, when he became controller of Dresser Manufacturing Company, Bradford, Pa., now an operating division of Dresser Industries, Inc. He became treasurer of that organization in 1932 and in 1943 was elected secretary and treasurer of Dresser Industries, Inc.

Rudolph E. Reimer

»

Fred M. Zeigler has been named managing director of Kern Trinidad Oilfields, Ltd., British West Indies subsidiary of Kern Oil Company, Ltd., London. Zeigler has long been associated with the California company of Kern Oil Company, Ltd., and his new duties will call for a division of time between Trinidad and California.

»

J. C. Ballagh, vice president and general manager of Patterson-Ballagh, Division of Byron Jackson Company, left New York April 15 for a six weeks' business trip in England and the continent. He plans to spend about four weeks in England and will headquarter at the office of H. F. Towler, 9 Cavendish Sq., London W1, Eng. In France he will discuss future business in the development and uses of oil field rubber specialties.

Deaths

Waldo Moutray, 49, West Central Texas producer and drilling contractor, died of a heart attack April 15 at Abilene. He was associated with his father, **E. W. Moutray,** in the operation of a refinery near Abilene for a number of years.

»

Bill Jack Curry, 29, engineer for Lone Star Gas Company, was killed April 12 while at work on a well near Cisco, Texas.

»

Arthur Wilson Epley, Jr., 30, a party chief for Seismic Exploration Company, died April 22 in Corpus Christi, Texas. A former Houston resident, he moved to George West, Texas, two months ago. He was a 1937 graduate of Rice Institute and had been with Seismic for ten years.

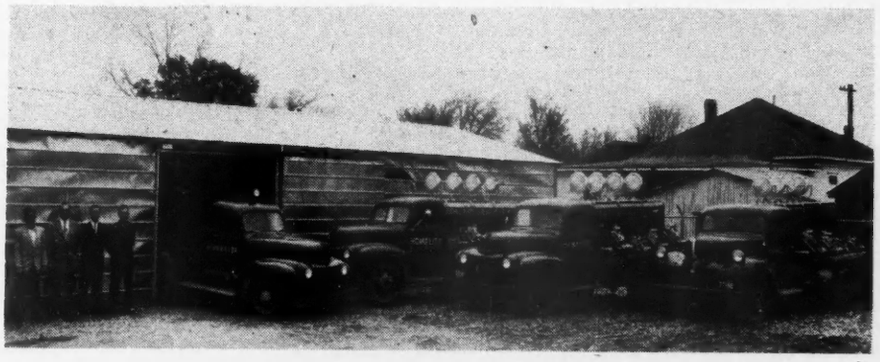
»

J. J. Dunlevy, 56, manager of pipe lines and crude purchasing for Freedom-Valvoline Oil Company, Freedom, Penn., and his wife were killed April 27 in an automobile accident near Irwin, Penn.

»

Walter B. Haislip, vice president and sales manager for Diamond Chain Company, Indianapolis, died April 11.

Gulf Coast Office Opened by Homelite



Staff of the Homelite Corporation's new Gulf Coast sales and service office is shown with the fleet of demonstration and maintenance trucks assigned to the Southwest oil industry area. Left to right are James C. Leath, service manager; Paul E. Ryan, Southwest regional manager; John Branch, Louisiana representative, and William (Bill) Stringer, Gulf Coast and Southwest representative.

Opening of a Gulf Coast sales and service office in Houston was announced by Paul E. Ryan, Southwest regional manager in Dallas for Homelite Corporation, manufacturer and distributor of portable gasoline-powered self-priming pumps, generators, and blowers.

The Houston office was opened to handle the increased sales and service volume on Homelite products used by the industry, Ryan said. A fleet of service and sales demonstration trucks for Homelite's line of portable units will operate out of the Gulf Coast office on the same plan as fleets from other Homelite offices from coast to coast.

"The Homelite Corporation through its new Houston office is anxious to offer every service to the oil industry in the Gulf area through the facilities afforded by our truck fleet in the field," Ryan declared.

The new offices and warehouse are located at 3904 Burch Street, Houston. Home office of the corporation is in Port Chester, N. Y.

Black, Sivalls & Bryson Opens Sales Branch at Lubbock, Texas

Floyd C. Myers, regional manager of Black, Sivalls & Bryson, Inc., announced the opening of a sales and service branch at Lubbock, Texas. The branch will specialize in oil field equipment, and will also act as an outlet for BS&B special products.

Clint G. Ross, who for the past several years has managed the Artesia, New Mexico, branch, will direct the new operations.

Kerotest Opens New West Coast Offices, Names Sales Manager

Kerotest Manufacturing Company of Pittsburgh, manufacturer of cast steel and brass valves and fittings, has announced the appointment of James A Norris as West Coast Division sales manager and the opening of new division offices at 315 West Ninth Street, Los Angeles 15.

Kerotest formerly occupied offices at 3305 East Slauson Avenue, Los Angeles 22. Warehouse stocks of valves and fittings will be carried for West Coast distribution. Joseph A. Swaton and John H. Mueller will continue as West Coast field representatives.

Tuboscope Plans Offices in Colorado's Rangely Field

Tuboscope, oil field tubular goods inspection specialist, is operating in the Rangely field, Colorado, and will shortly establish permanent offices in the Rocky Mountain area. For the time being, the Rangely operations are being directed from Tuboscope headquarters in Houston.

According to W. H. Hopkins, Tuboscope president and general manager, plans have been approved for extending his company's tubular inspection services to Mexico and Canada in the near future.

Giant Gas Engine-Driven Angle Compressor Now Being Produced

Production of a gas engine-driven angle compressor said to be the largest in the world, and which is expected to effect substantial savings in installation and piping costs in the natural gas transmission and processing industries, is now under way in the Mount Vernon, Ohio, plant of The Cooper-Bessemer Corporation.

Five of the new giant units, known as the Type GMW, have been ordered by Panhandle Eastern Pipeline Company to meet demands for natural gas in the Eastern and Mid-Western industrial areas, according to Stanley E. Johnson, Cooper-Bessemer vice president and director of sales.

The new compressor was designed for the gas transmission and natural gas processing industries, and is expected to find widespread demand because of the potential saving it offers in the reduction of installation, piping, foundation, and other building and servicing costs. The user's estimates indicate savings in installation costs ranging from $6 to $12 per horsepower.

The Type GMW is a two-cycle V-type engine and is available in six, eight, and ten-cylinder sizes. With an 18-inch bore and 20-inch stroke it is rated 240 horsepower per cylinder at a speed of 250 revolutions per minute.

The unit was designed so that it performs equally well as a gas or diesel power engine or as a gas engine-driven compressor. Since the compressor crosshead beds are not necessary to the scavenging system, they are removed from a unit used for power application, thus increasing the space saving possibilities.

AVAILABLE JUNE 15

THE FLOW OF HOMOGENEOUS FLUIDS THROUGH POROUS MEDIA

By MORRIS MUSKAT,

Chief of Physics Division, Gulf Research and Development Company

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Lufkin Company Opens Foundry; Foundrymen's Association Meets

The new gray iron foundry of the Lufkin Foundry & Machine Company, Lufkin, Texas, was officially opened April 11 in connection with the Texas Chapter meeting of the American Foundrymen's Association.

The two-fold occasion attracted 200 foundrymen from Texas and Louisiana. Among the out-of-state visitors were S. W. Wood of Minneapolis, president of the association; William Maloney of Chicago, secretary; Frank Steinebach of Cleveland, Ohio, editor of *Foundry* magazine; David Anderson of National Founders Association, Chicago; Roy Schumacher of Cincinnati; and Howard Nelson of Birmingham, Ala.

The new foundry, located in the center of a 68-acre tract, has a melting capacity of 160 tons per eight hours. The main bay with four 10-ton cranes is 60 feet wide and 780 feet long. Two 70-foot cupolas, each capable of handling 20 tons per hour, are used on alternate days.

Offices Moved

Mathiasen's Tanker Industries, Inc., is moving its offices to the Public Ledger Building, Philadelphia, effective May 1.

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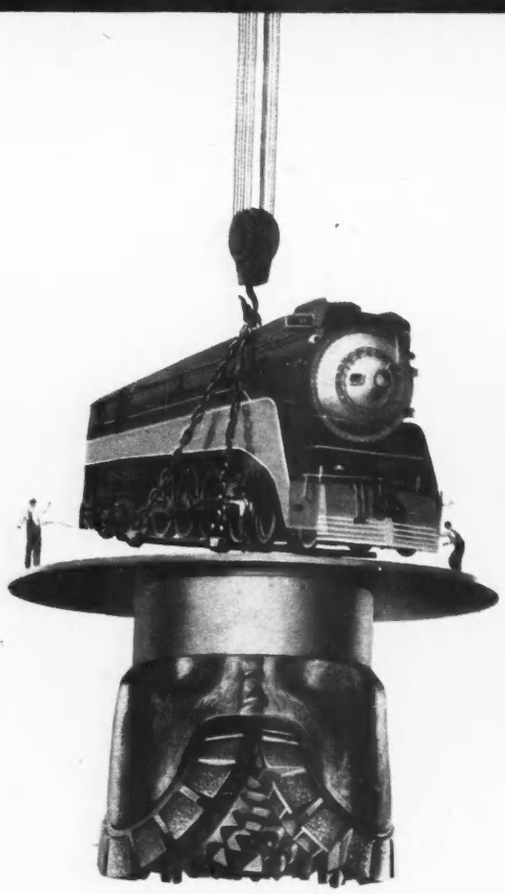

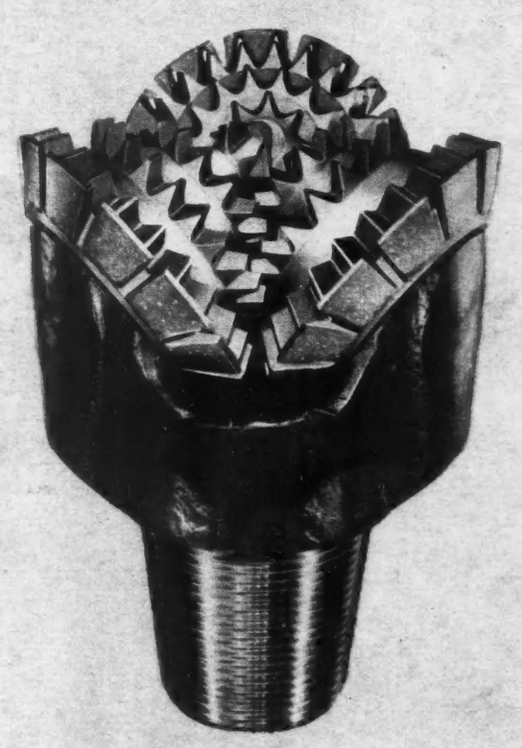

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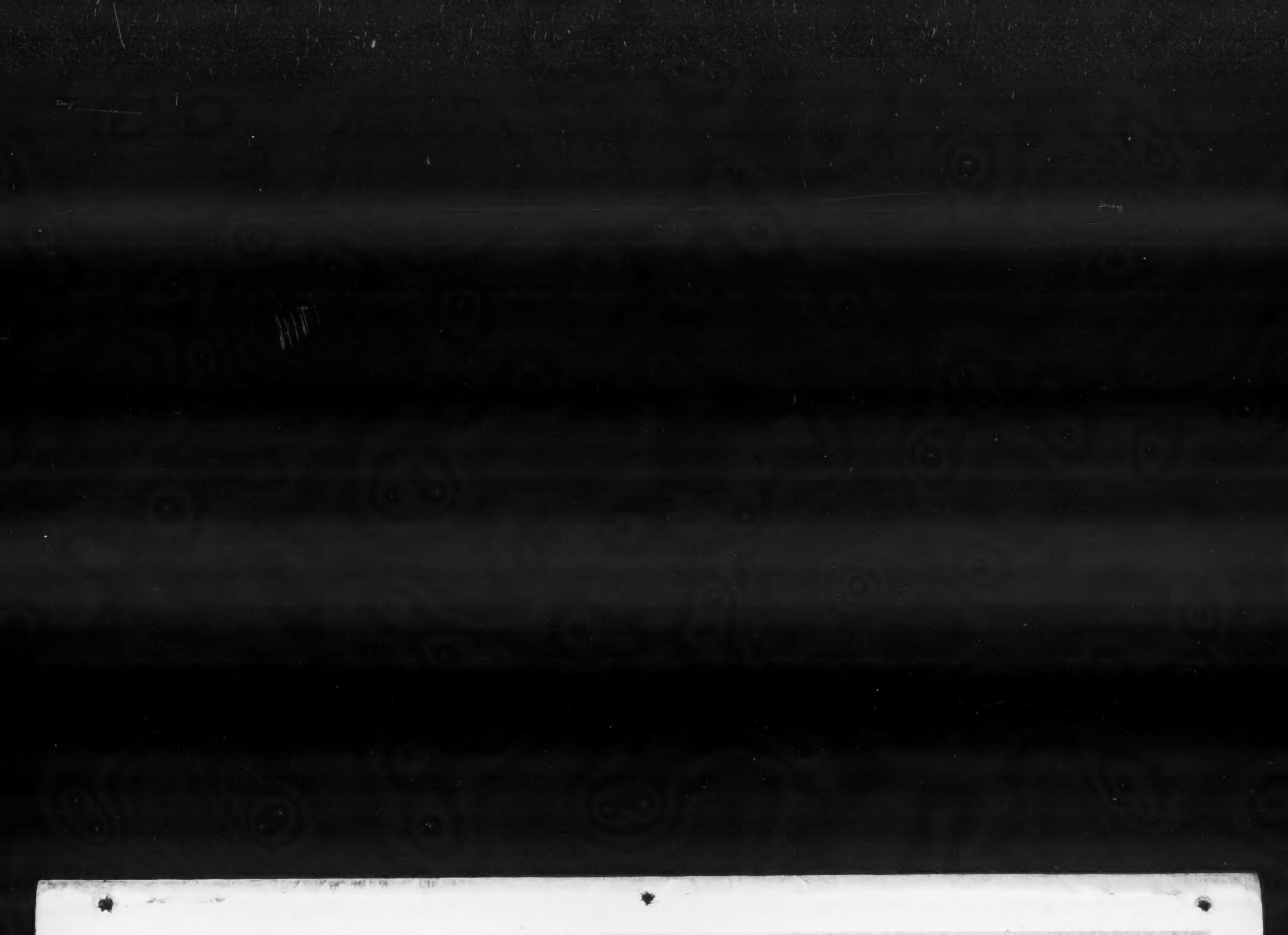

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FOR ACCURACY

C. A. Barabe, assistant Eastern Division sales manager of Caterpillar Tractor Company, will start a six-month medical leave of absence June 15, and **W. N. Foster,** divisional district representative, has been promoted to the assistant managership. Barabe, a member of the Caterpillar organization since 1937, served in the Army during World War 2 in the North African Sicilian and Italian campaigns and was severely wounded at Anzio, Italy. Foster joined Caterpillar in 1934 and became a district representative in 1944, serving Indiana, Kentucky, and a part of Ohio.

W. N. Foster

»

Commer Carey, T. B. Jackson and **Crawford B. Jackson,** all of Houston, have incorporated the Carey Drilling Corporation to operate in Texas.

»

E. J. Schiffer, veteran of 32 years in Gulf Oil Corporation's traffic department, has been named general traffic manager, succeeding the late **J. C. Beck.**

»

Edgar A. Rogers, Chattanooga Bank Building, Chattanooga, Tenn., has announced the association with him of **Chester A. Roush, Jr.** Rogers' business is the analysis of process plant requirements and the application of equipment. Roush is a chemical engineering graduate of Georgia Tech who has recently returned from duty with the U. S. Navy as a lieutenant in submarines.

»

Dwight Davis has been transferred from the Shreveport, La., to the Jackson, Miss., office of Barnsdall Oil Company as district landsman.

»

Hubert Guyod, Houston well logging consultant spoke before the Petroleum Engineering Club (AIME student affiliate) of Texas A. & M. College April 25.

»

Robert P. Tyler, formerly general sales manager, has been named vice president in charge of sales for Macwhyte Company, Kenosha, Wis.

»

A. B. Reese, Jr. has been appointed regional sales manager at Ft. Worth, Texas, of the Superior Engine Division of The National Supply Company, according to **Robert M. Pearson,** sales manager of the division. Reese, an engineering graduate of Ohio State University, has been assistant chief engineer of the division's Springfield, Ohio plant.

A. B. Reese, Jr.

Rudolph E. Reimer, secretary and treasurer of Dresser Industries, Inc., Cleveland, was elected a vice president of the company. Reimer has been associated with Dresser interests since 1929, when he became controller of Dresser Manufacturing Company, Bradford, Pa., now an operating division of Dresser Industries, Inc. He became treasurer of that organization in 1932 and in 1943 was elected secretary and treasurer of Dresser Industries, Inc.

Rudolph E. Reimer

»

Fred M. Zeigler has been named managing director of Kern Trinidad Oilfields, Ltd., British West Indies subsidiary of Kern Oil Company, Ltd., London. Zeigler has long been associated with the California company of Kern Oil Company, Ltd., and his new duties will call for a division of time between Trinidad and California.

»

J. C. Ballagh, vice president and general manager of Patterson-Ballagh, Division of Byron Jackson Company, left New York April 15 for a six weeks' business trip in England and the continent. He plans to spend about four weeks in England and will headquarter at the office of H. F. Towler, 9 Cavendish Sq., London W1, Eng. In France he will discuss future business in the development and uses of oil field rubber specialties.

Deaths

Waldo Moutray, 49, West Central Texas producer and drilling contractor, died of a heart attack April 15 at Abilene. He was associated with his father, **E. W. Moutray,** in the operation of a refinery near Abilene for a number of years.

»

Bill Jack Curry, 29, engineer for Lone Star Gas Company, was killed April 12 while at work on a well near Cisco, Texas.

»

Arthur Wilson Epley, Jr., 30, a party chief for Seismic Exploration Company, died April 22 in Corpus Christi, Texas. A former Houston resident, he moved to George West, Texas, two months ago. He was a 1937 graduate of Rice Institute and had been with Seismic for ten years.

»

J. J. Dunlevy, 56, manager of pipe lines and crude purchasing for Freedom-Valvoline Oil Company, Freedom, Penn., and his wife were killed April 27 in an automobile accident near Irwin, Penn.

»

Walter B. Haislip, vice president and sales manager for Diamond Chain Company, Indianapolis, died April 11.

Gulf Coast Office Opened by Homelite

Staff of the Homelite Corporation's new Gulf Coast sales and service office is shown with the fleet of demonstration and maintenance trucks assigned to the Southwest oil industry area. Left to right are James C. Leath, service manager; Paul E. Ryan, Southwest regional manager; John Branch, Louisiana representative, and William (Bill) Stringer, Gulf Coast and Southwest representative.

Opening of a Gulf Coast sales and service office in Houston was announced by Paul E. Ryan, Southwest regional manager in Dallas for Homelite Corporation, manufacturer and distributor of portable gasoline-powered self-priming pumps, generators, and blowers.

The Houston office was opened to handle the increased sales and service volume on Homelite products used by the industry, Ryan said. A fleet of service and sales demonstration trucks for Homelite's line of portable units will operate out of the Gulf Coast office on the same plan as fleets from other Homelite offices from coast to coast.

"The Homelite Corporation through its new Houston office is anxious to offer every service to the oil industry in the Gulf area through the facilities afforded by our truck fleet in the field," Ryan declared.

The new offices and warehouse are located at 3904 Burch Street, Houston. Home office of the corporation is in Port Chester, N. Y.

Black, Sivalls & Bryson Opens Sales Branch at Lubbock, Texas

Floyd C. Myers, regional manager of Black, Sivalls & Bryson, Inc., announced the opening of a sales and service branch at Lubbock, Texas. The branch will specialize in oil field equipment, and will also act as an outlet for BS&B special products.

Clint G. Ross, who for the past several years has managed the Artesia, New Mexico, branch, will direct the new operations.

Kerotest Opens New West Coast Offices, Names Sales Manager

Kerotest Manufacturing Company of Pittsburgh, manufacturer of cast steel and brass valves and fittings, has announced the appointment of James A Norris as West Coast Division sales manager and the opening of new division offices at 315 West Ninth Street, Los Angeles 15.

Kerotest formerly occupied offices at 3305 East Slauson Avenue, Los Angeles 22. Warehouse stocks of valves and fittings will be carried for West Coast distribution. Joseph A. Swaton and John H. Mueller will continue as West Coast field representatives.

Tuboscope Plans Offices in Colorado's Rangely Field

Tuboscope, oil field tubular goods inspection specialist, is operating in the Rangely field, Colorado, and will shortly establish permanent offices in the Rocky Mountain area. For the time being, the Rangely operations are being directed from Tuboscope headquarters in Houston.

According to W. H. Hopkins, Tuboscope president and general manager, plans have been approved for extending his company's tubular inspection services to Mexico and Canada in the near future.

Giant Gas Engine-Driven Angle Compressor Now Being Produced

Production of a gas engine-driven angle compressor said to be the largest in the world, and which is expected to effect substantial savings in installation and piping costs in the natural gas transmission and processing industries, is now under way in the Mount Vernon, Ohio, plant of The Cooper-Bessemer Corporation.

Five of the new giant units, known as the Type GMW, have been ordered by Panhandle Eastern Pipeline Company to meet demands for natural gas in the Eastern and Mid-Western industrial areas, according to Stanley E. Johnson, Cooper-Bessemer vice president and director of sales.

The new compressor was designed for the gas transmission and natural gas processing industries, and is expected to find widespread demand because of the potential saving it offers in the reduction of installation, piping, foundation, and other building and servicing costs. The user's estimates indicate savings in installation costs ranging from $6 to $12 per horsepower.

The Type GMW is a two-cycle V-type engine and is available in six, eight, and ten-cylinder sizes. With an 18-inch bore and 20-inch stroke it is rated 240 horsepower per cylinder at a speed of 250 revolutions per minute.

The unit was designed so that it performs equally well as a gas or diesel power engine or as a gas engine-driven compressor. Since the compressor crosshead beds are not necessary to the scavenging system, they are removed from a unit used for power application, thus increasing the space saving possibilities.

AVAILABLE JUNE 15

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By MORRIS MUSKAT,

Chief of Physics Division, Gulf Research and Development Company

Permission has been granted by McGraw-Hill Publishing Company, Inc., to reprint this book, originally published in 1937. Dr. Muskat deals with all typical problems that are of some practical interest, and particularly stresses illustration of various analytical methods for solving flow problems.

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Lufkin Company Opens Foundry; Foundrymen's Association Meets

The new gray iron foundry of the Lufkin Foundry & Machine Company, Lufkin, Texas, was officially opened April 11 in connection with the Texas Chapter meeting of the American Foundrymen's Association.

The two-fold occasion attracted 200 foundrymen from Texas and Louisiana. Among the out-of-state visitors were S. W. Wood of Minneapolis, president of the association; William Maloney of Chicago, secretary; Frank Steinebach of Cleveland, Ohio, editor of *Foundry* magazine; David Anderson of National Founders Association, Chicago; Roy Schumacher of Cincinnati; and Howard Nelson of Birmingham, Ala.

The new foundry, located in the center of a 68-acre tract, has a melting capacity of 160 tons per eight hours. The main bay with four 10-ton cranes is 60 feet wide and 780 feet long. Two 70-foot cupolas, each capable of handling 20 tons per hour, are used on alternate days.

Offices Moved

Mathiasen's Tanker Industries, Inc., is moving its offices to the Public Ledger Building, Philadelphia, effective May 1.

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Owner acquiring larger plane wishes to sell completely equipped five place twin motor Cessna which in April was overhauled, checked and approved by C.A.A. No expense was spared in converting this airplane. Equipment includes automatic direction finder radio, complete instrumentation, highest quality upholstering and soundproofing, two spare engines, spare propellers, spare instruments. Cruising speed 150 miles per hour. Will demonstrate to prospective purchaser.

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